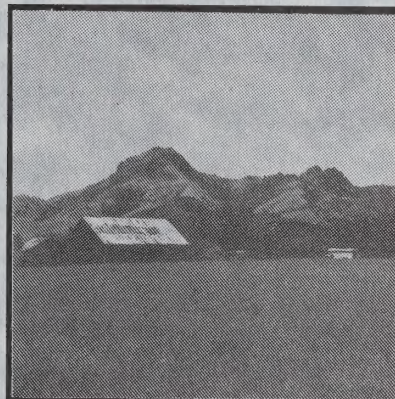


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County of Sutter

General Plan 2015

BACKGROUND REPORT



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**SUTTER COUNTY GENERAL PLAN
BACKGROUND REPORT**

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CHAPTER 1

POPULATION

1.1 INTRODUCTION

In order to effectively guide land use and development in the County and establish policies relating to housing and public services and facilities, it is important to understand who lives in the County, how the population has grown over time, and how it is projected to grow in the future. This chapter reviews historical population trends, current demographics, and population projections for Sutter County. In addition to the County-wide overview, population data for the County's two incorporated cities are included to provide insight into how demographics and growth characteristics vary within the County. The most recent population statistics have been taken from the 1990 U.S. Census, and should, therefore, provide a fairly accurate characterization of the County and its communities.

1.2 HISTORICAL POPULATION GROWTH

Sutter County was one of the original counties in the State of California when the State entered the Union on September 9, 1850. Principally an agricultural area without cities until the incorporation of Yuba City in 1908 and Live Oak in 1947, Sutter County's population was primarily rural until the 1960's when, due to significant growth in the unincorporated "Yuba City Urban Area", the urban and suburban population finally exceeded the rural farm population. The "Yuba City Urban Area" is an area defined by census tracts generally bound by Eager and Nuestro Roads to the north, the Sutter Extension Canal to the west, Oswald Road to the south, and the Feather River to the east. Table 1.2-1 shows the historical population growth of the County, its cities and unincorporated area. Table 1.2-2 shows the average annual rate of growth of the County, its cities and the unincorporated area by decade.

**TABLE 1.2-1
HISTORICAL POPULATIONS**

	SUTTER COUNTY	YUBA CITY	LIVE OAK	UNINCORP.
1900	5,886	*	*	5,886
1910	6,328	1,160	*	5,168
1920	10,115	1,708	*	8,407
1930	14,618	3,605	*	11,013
1940	18,680	4,968	*	13,712
1950	26,239	7,861	1,770	16,608
1960	33,380	11,507	2,276	19,597
1970	41,935	13,986	2,645	25,304
1980	52,246	18,736	3,103	30,407
1990	64,415	27,437	4,320	32,658

Source: U. S. Census

**TABLE 1.2-2
HISTORICAL ANNUAL POPULATION GROWTH RATES**

	SUTTER COUNTY	YUBA CITY	LIVE OAK	UNINCORP.
1900 - 1910	0.73%	*	*	(1.31%)
1910 - 1920	4.80%	3.94%	*	4.99%
1920 - 1930	3.75%	7.76%	*	2.74%
1930 - 1940	2.48%	3.26%	*	2.22%
1940 - 1950	3.46%	4.70%	*	1.62%
1950 - 1960	2.44%	3.88%	2.55%	1.79%
1960 - 1970	2.31%	1.97%	1.51%	2.78%
1970 - 1980	2.22%	2.97%	1.61%	1.85%
1980 - 1990	2.12%	3.89%	3.36%	0.72%

Source: U. S. Census

* City not incorporated.

TABLE 1.2-3

1995 POPULATION ESTIMATE

	SUTTER COUNTY	YUBA CITY	LIVE OAK	UNINCORP.
January 1, 1995	74,932	34,342	5,312	35,278

Source: California Department of Finance

Table 1.2-3 contains the January 1, 1995, population estimate for the County, it's cities, and the unincorporated area. The Department of Finance estimates that the incorporated area's population first exceeded the unincorporated area's population in 1991.

The 1990 U.S. Census credited Sutter County with a total population of 64,415; however, the October 1995 Sacramento Area Council of Government's (SACOG) projections are the most recent population projections for the County. SACOG projects that the County's population may be expected to grow from the current population of 74,932 to 116,000 by the year 2015. This reflects an annual growth rate of 2.21 percent. The County's growth rate between 1975 and 1995 was 2.47 percent.

TABLE 1.2-4**POPULATION ESTIMATES AND PROJECTIONS****Sutter County Population***

	1995	2000	2005	2010	2015
Y.C. Urban Area	56,536	64,785	73,339	81,981	90,817
(Yuba City)	34,342	39,900	45,500	51,200	57,200
(YCUA Unincorporated)	22,194	24,885	27,839	30,781	33,617
Live Oak	5,312	6,470	7,400	8,220	9,110
Remaining Unincorporated	13,084	13,895	14,561	15,399	16,073
(Total Unincorporated)	35,278	38,780	42,400	46,180	49,690
Sutter County Total	74,932	85,150	95,300	105,600	116,000

Source: SACOG and Sutter County Community Services Department

- * The above projections assume that over 83 percent of all new population increases will occur within the Yuba City Urban Area, that over 9 percent will occur in the City of Live Oak and that the remainder will occur uniformly throughout the rest of the unincorporated County area. The projections also assume that no growth to either city will occur through annexation.

Table 1.2-4 lists the population projections of the County and incorporated cities in five year intervals from 1995 to 2015. The projections reflected in this table show the highest growth rates occurring in the two incorporated cities. The annual growth rate of the unincorporated areas of the County over the next 20 years is projected to be 1.68 percent. In comparison, the annual growth rate for the cities of Yuba City and Live Oak over the same period of time is 2.48 percent and 2.57 percent respectively.

TABLE 1.2-5**POPULATION ESTIMATES AND PROJECTIONS****Sutter County Group Quarters Population**

	1995	2000	2005	2010	2015
Yuba City Urban Area	685	694	701	708	714
(Yuba City)	602	613	613	615	615
(YCUA Unincorporated)	83	81	88	93	99
Live Oak	268	508	508	508	508
Remaining Unincorporated	26	72	72	75	75
(Total Unincorporated)	109	153	160	168	174
Sutter County Total	979	1,274	1,281	1,291	1,297

Source: SACOG and Sutter County Community Services Department

Table 1.2-5 lists a group quarters projection of the community by five year intervals from 1995 to 2015. All persons not living in households are classified by the Census Bureau as living in group quarters. Two general categories of persons are recognized in group quarters. They are "Institutionalized" persons and "Noninstitutionalized" persons. Institutionalized persons include persons under formally authorized, supervised care or custody in institutions, such as prisons, military stockades, police lockups, halfway houses, local jails, nursing homes, mental hospitals, wards for the mentally ill or challenged, and other similar institutions. Noninstitutionalized persons include persons who live in group quarters other than institutions, such as homes for the mentally ill or challenged, homes for physically handicapped, maternity homes for unwed mothers, religious group quarters, emergency shelters, college dormitories and similar areas.

Tables 1.2-6 and 1.2-8 show the racial classification of the County, its cities and the unincorporated area in 1980 and 1990 respectively. Tables 1.2-7 and 1.2-9 show that some of those who responded in Tables 1.2-6 and 1.2-8 also claim hispanic origin. For example, looking at Tables 1.2-6 and 1.2-7, of the 42,893 Sutter County residents who indicated they were white, 1,924 of them also indicated they were of hispanic origin. Countywide, the hispanic community has accounted for the largest percentage increase in population of any racial group. In 1980, the hispanic population accounted for 11.7 percent of the County's population, while in 1990, it rose to 16.4 percent. This trend is even more apparent in the incorporated cities, where the hispanic population of Yuba City and Live Oak rose from 9.5 to 17.9 percent and 25 to 37 percent respectively.

TABLE 1.2-6**1980 RACIAL CLASSIFICATION BY AREA**

	SUTTER COUNTY	YUBA CITY	LIVE OAK	UNINCORP.
White	42,893 (82.1%)	16,094 (85.9%)	2,306 (74.3%)	24,493 (81%)
Black	562 (1.1%)	326 (1.7%)	2 (.1%)	234 (.8%)
American Indian/Eskimo	587 (1.1%)	279 (1.5%)	33 (1.1%)	275 (.9%)
Japanese	563 (1.1%)	126 (.7%)	11 (.4%)	426 (1.4%)
Chinese	201 (.4%)	113 (.6%)	2 (.1%)	86 (.3%)
Filipino	172 (.3%)	53 (.3%)	7 (.2%)	112 (.4%)
Korean	40 (.1%)	22 (.1%)	0 (0%)	18 (.1%)
Asian Indian	2,585 (5%)	525 (2.8%)	186 (6%)	1,874 (6.2%)
Vietnamese	15 (<.1%)	6 (<.1%)	0 (0%)	9 (<.1%)
Hawaiian/Pacific Islander	21 (<.1%)	10 (<.1%)	0 (0%)	11 (<.1%)
Other	4,607 (8.8%)	1,182 (6.3%)	556 (17.9%)	2,869 (9.4%)
Total	52,246 (100%)	18,736 (99%*)	3,103 (100%)	30,407 (100%)

Source: 1980 U. S. Census

* The sum of the column was derived due to rounding.

TABLE 1.2-7**1980 HISPANIC ORIGIN BY RACIAL CLASSIFICATION AND AREA**

	SUTTER COUNTY	YUBA CITY	LIVE OAK	UNINCORP.
White	1,924	662	274	988
Black	10	4	1	5
Asian	153	71	31	51
Other	4,011	1,037	470	2,504
Total	6,098	1,774	776	3,548

Source: 1980 U. S. Census

TABLE 1.2-8**1990 RACIAL CLASSIFICATION BY AREA**

	SUTTER COUNTY	YUBA CITY	LIVE OAK	UNINCORP.
White	49,521 (76.8%)	20,876 (76.1%)	2,486 (57.5%)	26,159 (80.1%)
Black	1,041 (1.6%)	713 (2.6%)	43 (1%)	285 (.9%)
American Indian/Eskimo	941 (1.5%)	457 (1.7%)	74 (1.7%)	410 (1.3%)
Japanese	519 (.8%)	152 (.6%)	16 (.4%)	351 (1.1%)
Chinese	224 (.3%)	120 (.4%)	2 (<.1%)	102 (.3%)
Filipino	356 (.6%)	180 (.7%)	14 (.3%)	162 (.5%)
Korean	106 (.2%)	54 (.2%)	0 (0%)	52 (.2%)
Asian Indian	4,200 (6.5%)	1,273 (4.6%)	349 (8.1%)	2,578 (7.9%)
Vietnamese	35 (.1%)	24 (.1%)	0 (0%)	11 (<.1%)
Hawaiian/Pacific Islander	124 (.2%)	48 (.2%)	0 (0%)	76 (.2%)
Other	7,348 (11.4%)	3,540 (12.9%)	1,336 (30.9%)	2,472 (7.6%)
Total	64,415 (100%)	27,437 (101%*)	4,320 (100%)	32,658 (100%)

Source: 1990 U. S. Census

* The sum of the column was derived due to rounding.

TABLE 1.2-9**1990 HISPANIC ORIGIN BY RACIAL CLASSIFICATION AND AREA**

	SUTTER COUNTY	YUBA CITY	LIVE OAK	UNINCORP.
White	3,381	1,454	297	1,630
Black	54	24	2	28
Asian	331	142	24	165
Other	6,826	3,289	1,283	2,254
Total	10,592	4,909	1,606	4,077

Source: 1990 U. S. Census

1.3 FINDINGS

- Sutter County has experienced moderate growth over the last several decades, with the incorporated communities receiving larger percentages of growth.
- Historical populations were larger in the rural area until 1991 when the incorporated area's population surpassed the unincorporated area.
- The 1990 census shows Sutter County's population contains some ethnic diversity, with over 75% of the County being white, and the hispanic population being the next largest category (over 16 percent) and the fastest growing segment.

1.4 BIBLIOGRAPHY

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CHAPTER 2

LAND USE

2.1 INTRODUCTION

REGIONAL SETTING

Sutter County lies in a portion of north central California known as the Sacramento Valley, approximately 40 miles north of Sacramento. State Highway 99, which extends in a north-south direction through the County, defines the principal transportation corridor connecting the County to the region. State Route 20 is the principal east-west corridor between Highway 99 and Interstate 5. Figure 2.1-1 depicts Sutter County's location.

COUNTY BOUNDARIES AND PLANNING AREAS

Sutter County's jurisdictional boundaries are generally defined by Yolo and Colusa Counties to the west with the Sacramento River and Butte Slough forming the western boundary; Butte County to the north; Yuba and Placer Counties to the east with the Feather and Bear Rivers forming the eastern boundary; and Sacramento County to the south. The County encompasses approximately 607 square miles (388,358 acres), which can be divided into two general topographical areas: a valley area and the Sutter Buttes.

The County includes two incorporated cities (the City of Yuba City and the City of Live Oak) and several unincorporated rural communities. A distinct "Yuba City Urban Area" exists which according to the U.S. Census includes incorporated Yuba City, the unincorporated land area immediately surrounding the incorporated city limits (the urban fringe), and Tierra Buena. As noted in the Population Chapter, the census tracts which delineate the "Yuba City Urban Area" are generally bound by Eager and Nuestro Roads to the north, the Sutter Extension Canal to the west, Oswald Road to the south, and the Feather River to the east. Table 2.1-1 identifies each of the incorporated cities and rural communities by size. Table 2.1-2 shows the growth in area (acres) of the County's two cities between January 1985 and January 1996. Figure 2.1-2 shows the location of each city and rural community in the County.

2.2 EXISTING SUTTER COUNTY GENERAL PLAN

GENERAL PLAN HISTORY

Sutter County's first general plan was adopted in 1964. This general plan contained only land use and transportation elements and was a result of two planning studies by Mr. James Campbell in 1954 and 1958. These early contracts were joint efforts between the City of Yuba City, the State Department

of Finance and the County of Sutter. Sutter County's adoption of its first general plan was delayed in 1956 due to the Yuba City Flood of December 1955. In 1958 a second federal "701" joint grant for planning studies was awarded and the effort resulted in the adoption of the 1964 general plan.

TABLE 2.1-1

INCORPORATED CITIES AND RURAL COMMUNITIES BY SIZE

(As of January 1, 1996)

INCORPORATED CITY:	AREA - acres	AREA - sq mi
Yuba City	5,658	8.8414
Live Oak	1,167	1.8234
RURAL COMMUNITY:		
Sutter	599	.94
Robbins	302	.47
Rio Oso	246	.38
Nicolaus	35	.05
Meridian	132	.20
East Nicolaus/Trowbridge	249	.40
UNINCORPORATED SUTTER COUNTY	379,970	593.71
SUTTER COUNTY GRAND TOTAL	388,358	606.81

Source: Sutter County Community Services Department

TABLE 2.1-2

CITY AREA
(As of January 1, 1996)

	CITY OF YUBA CITY	CITY OF LIVE OAK
1985	3,582 Acres	844 Acres
1990	4,420 Acres	910 Acres
1995	5,412 Acres	1,167 Acres
1996	5,658 Acres	1,167 Acres
Change 1985 to 1996	2,076 Acres	323 Acres

Source: Sutter County LAFCO

Oregon

SUTTER COUNTY

LOCATION MAP



prepared by the
SUTTER COUNTY COMMUNITY SERVICES DEPARTMENT

Sutter County

Sacramento

Lake Tahoe

Nevada

San Francisco

to Los Angeles

Figure 2.1-1
Location Map

SUTTER COUNTY

AREA PLANS and RURAL COMMUNITY PLANS



0 10000 20000
SCALE IN FEET

prepared by the
SUTTER COUNTY COMMUNITY SERVICES DEPARTMENT

- LEGEND**
-  Incorporated city
 -  Rural communities
 -  Area plans

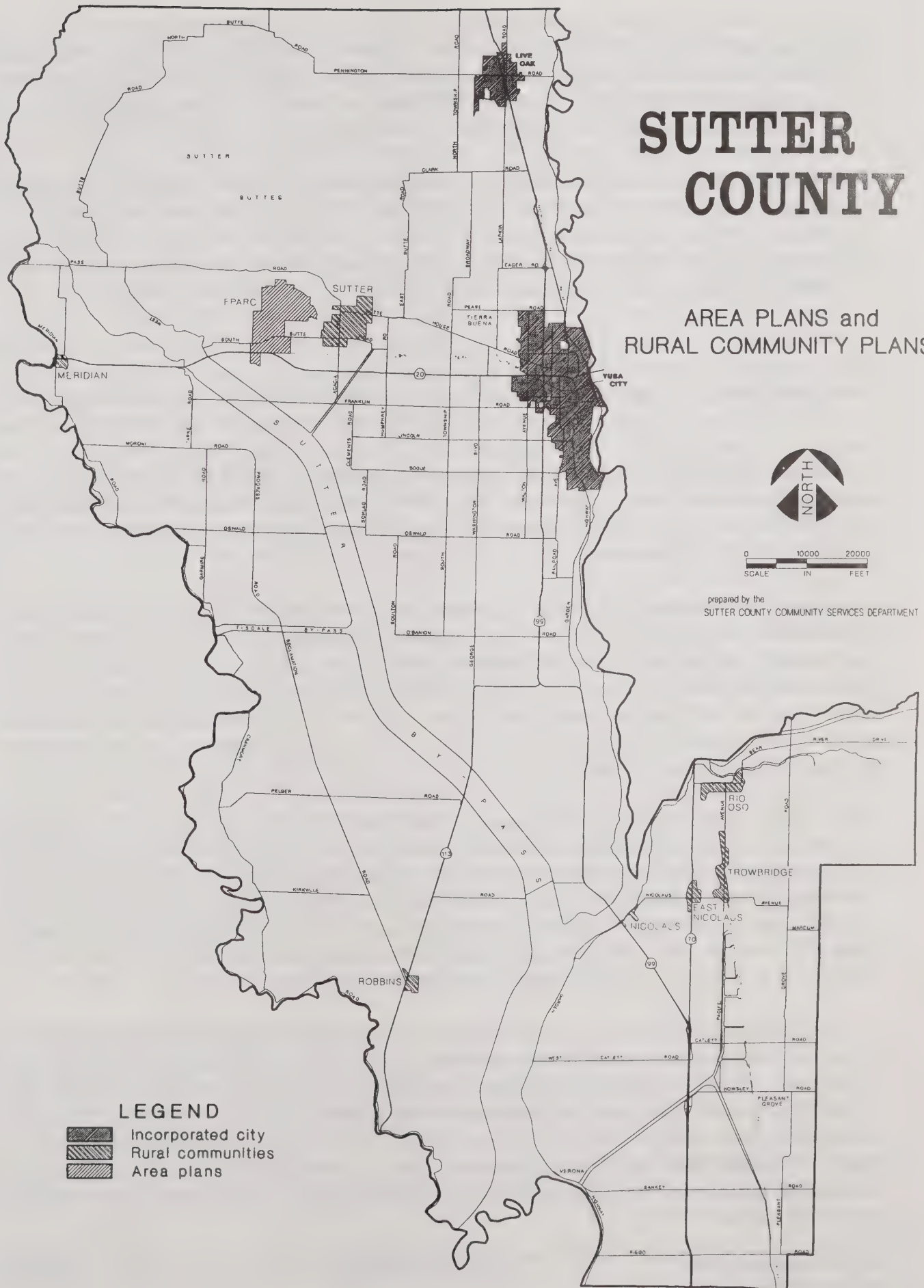


Figure 2.1-2
Sutter County Area
Plans & Rural Communities

The City of Yuba City adopted its first master plan (later called a general plan) in 1956 which was later amended in 1958. The City of Live Oak adopted its first general plan in 1962 which substantially mirrored the County Master Plan Reports prepared by Mr. Campbell in 1954 and 1958. Sutter County's 1964 General Plan did not provide guidance in the way of development density and intensity of land use for those areas immediately surrounding the two incorporated cities.

Sutter County's 1964 Plan did reflect a large urban area around the City of Yuba City and smaller urban populations around both Sutter and Live Oak. The early plan also identified a rural community of Riego which centered on the intersection of Pleasant Grove and Riego Roads. The Plan showed Riego as containing a small residential population with a large industrial area. Other rural communities identified by the plan were East Nicolaus, Meridian and Robbins.

Modifications to the County's General Plan were proposed in 1968. A Recreation Element was added which contained a survey of existing County fishing access points and comments on the potential for hiking and other recreational activities in the Sutter Buttes. A new Rural Communities Land Use Plan was proposed but not adopted. The Rural Communities Land Use Plan proposed specific land use designations and boundaries for each of the rural communities contained in the 1964 Plan, added Trowbridge, Pleasant Grove, Rio Oso and Tudor as rural communities, and modified Riego to eliminate the residential area and reduce the industrial area. Though not adopted, the 1968 Rural Communities Plan appears to be used as the basis for later General Plan revisions, particularly the 1972 Riego Plan.

Recognizing the importance of protecting agriculture from suburban encroachment, Sutter County created a new zoning district in 1972, the AG (General Agricultural) District. A County-wide rezone was initiated over the next couple of years to eliminate the County's A-1 (unclassified) Zoning District and other non-agriculturally zoned parcels located in rural areas of the County to reduce land use practices which did not necessarily compliment agricultural uses. The changes were consistent with the 1964 General Plan and redirected urban/suburban type development into the established urban areas in the General Plan.

Other changes occurring in 1972 included the adoption of a Housing Element, Conservation Element, and a new Transportation and Land Use Element for the Riego area. The Housing Element was prepared as a joint effort by Sutter County, the City of Yuba City and then Sacramento Regional Planning Commission and was the first look at the community's housing problems from a systematic approach. The Conservation Element reduced the unincorporated urban/suburban areas surrounding Yuba City and Live Oak. The Riego Plan reduced the industrial area from over 1,800 acres to approximately 200 acres and eliminated the residential area entirely.

In 1974 the County modified the Land Use Element to include language clarifying development policies for the unincorporated areas. The document states "...Yuba City Planning Area will continue as the principal urban community in Sutter County." The recommendations of the plan were intended "...to reduce scattered or leapfrog development, preserve agriculture and reduce travel time and costs for government, business and residents." A revised land use map was adopted and specific detail for lands within the urban boundary were identified. The revised land use map contained the same urban boundary as the 1972 Conservation Element's land use map. Yuba City adopted the same land use plan in 1973.

In 1978, a joint Yuba City Urban Area General Plan was adopted by Yuba City and Sutter County. For the most part, this is still the plan in effect today for the unincorporated Yuba City Urban Area. The Plan involved a major reduction in development area from the 1964 Plan and recognized the need to provide a higher degree of infrastructure for new development. The boundary for Yuba City Urban Area expansion was reduced to match the boundary of the Gilsizer Drainage District and also included land area south of Yuba City along Garden Highway that is between the Drainage District and the Feather River. A delineation of Tierra Buena was made and together with the newly defined Yuba City expansion area, the first definitive Yuba City Urban Area boundary was established. This Plan combined in one document the land use, housing, transportation and public facilities elements as well as the environmental document. The following year (1979) Yuba City and Sutter County jointly adopted a Noise Element which was later adopted as the Noise Element for the Live Oak General Plan.

A new community plan was adopted for Sutter in 1980. The plan restricted Sutter's development to its present boundaries until full urban services could be provided.

Several modifications to the County's General Plan occurred in 1982. Sutter County adopted the City of Live Oak's General Plan as the County Plan for the unincorporated Live Oak Planning Area. New land use, transportation and public facilities elements were approved by the Board of Supervisor's for Tierra Buena and Measure A was approved by the voters to create the Food Processing, Agricultural and Recreation Combining (FPARC) zone district and area plan. The Tierra Buena Area Plan reduced densities and intensities of land use due to the lack of public sewer service and was later amended (1983) to include density averaging for larger development projects. The FPARC plan consists of approximately 1,800 acres, including land area on the southern flanks of the Sutter Buttes and land area between South Butte Road and State Highway 20, intended to provide agriculturally related industrial activities.

In 1983, the County adopted a new general plan. This plan retained and incorporated by reference the previously adopted Yuba City Urban Area General Plan, the Live Oak General Plan and the Tierra Buena Area General Plan. Additionally, although not specifically referenced and incorporated into the document, the Community of Sutter General Plan was also left in effect. The 1983 Plan contained the primary agricultural policies for development in the non-urban areas, redefined the boundaries of the existing rural communities of East Nicolaus, Meridian and Robbins, and added the rural communities of Nicolaus, Rio Oso and Trowbridge. The Plan also deleted the previously adopted boundary for the community of Riego and described Pleasant Grove as a general area, not as a rural community. This plan is referred to as the "Rural General Plan".

In 1989, Sutter County adopted a Recreation Activities Element to the plan which inventoried existing County recreational facilities in the unincorporated area as well as major private facilities. The 1989 Recreation Element established criteria for zoning compatibility for future recreational uses. Also in 1989, the City of Yuba City adopted a new General Plan. The City's new General Plan Land Use Map includes land use designations in the unincorporated Yuba City Urban Area. Though largely similar, the City's land use designations do not necessarily match the County's designations for the same area. The County has not adopted the City's 1989 General Plan by reference as was done in previous years.

The next change to the County's General Plan occurred in 1991 with the adoption of the South Sutter County General Plan Amendment (SSC GPA). The South Sutter plan replaced all previous General Plan land use designations and policies with new residential, commercial, industrial, open space and agricultural designations for the plan area. The South Sutter Plan was prepared in response to regional growth occurring in the greater Sacramento area. In Sutter County specifically, a request for the expansion of industrial development was filed in 1984 along Riego Road. The application was incomplete and in 1985 a new applicant took over the application and began the preparation of an environmental document. By 1987, the County had received interest in the development of over 4,000 acres in the South County area because of its proximity to Sacramento. Due to the limited (virtually non-existent) public facilities/services in the area and the need for such facilities given the type of development proposed, the County determined that it would be necessary to consider the development requests in the context of future plans for the area and the resultant South County Area Plan was prepared.

The South Sutter Plan would have created a new urban area consisting of approximately 24,000 acres and a potential population at build-out of 140,000 people over a 40 year period of time. However, after the Board of Supervisors approved the plan in 1991, a referendum to overturn the Board's action was approved by County voters. The applicants then filed a lawsuit to invalidate the referendum. On June 9, 1995 a Sutter County Superior Court decision determined that the referendum was valid. As of March 1996, the effect of the voter action and the status of the South County Area Plan is currently under appeal.

In 1993, the County updated the General Plan Housing Element. The purpose of the update was to bring the Housing Element into full compliance with the State's requirements. The Element incorporated many of the work programs and policies of the South County Area Plan. It also further defines and clarifies agricultural policies pertaining to housing and the creation of new homesites in the rural area as they relate to land use policy.

COMPREHENSIVE GENERAL PLAN PROCESS

In 1993 Sutter County initiated a comprehensive update of its general plan. The update process was divided into two phases. The first phase was essentially a technical exercise designed to achieve the following:

- Revise and update all supporting documentation for the General Plan.
- Revise the format of the current plan to consolidate all policy information (goals, policies and diagrams) into a single integrated document.
- Correct any identified deficiencies with the plan to bring it into conformance with current state requirements.
- Strengthen agricultural policies where appropriate.

On December 6, 1994 the Technical Update was completed and resulted in a new County General Plan. With the adoption of the General Plan Technical Update, phase two, known as the Comprehensive General Plan Revision (CGPR) was initiated.

A twenty-five member Citizens Advisory Committee (Committee) was appointed by the Board of Supervisors to assist in identifying and resolving issues and to allow for maximum public participation.

On March 13, 1995, Sutter County initiated the "Issue Identification" phase of the CGPR process. This phase consisted of alternating study sessions (which included the Board of Supervisors, the Planning Commission and the Committee) and Committee meetings. Study sessions allowed experts and leaders from their respective professions to speak and provide insight on five primary topics. Study sessions also provided a forum for public participation and issue refinement while serving as an educational tool. The five primary topics of discussion included: Agriculture, Industry/Commerce, Urban Development, Infrastructure, and Open Space. On intervening weeks between study sessions, Committee meetings were held to isolate key issues and build consensus. The Committee meetings also served to further public participation and discussion of community goals, ideas, and expectations. The "Issue Identification" phase consisted of 15 meetings and was completed on June 26, 1995. Approximately 115 issues were identified.

On July 24, 1995, the "Issue Resolution" phase of the CGPR process began with a series of five special joint study sessions attended by the Board of Supervisors, the Planning Commission, the Citizen's Advisory Committee, and the general public. The purpose of the joint study sessions was to address key policy questions and issues. Following the conclusion of these sessions, a work program was developed. The work program outlined the process through which issues would be addressed/resolved and provided time and cost estimates for completion of the CGPR process. Repetitive and similar issues were combined to create efficiency and eliminate redundancy. Other issues were identified as staff tasks that required development of policy language or modifications to existing policies. The remaining 32 issues were left to be resolved through Committee "Issue Resolution" meetings. Some of the key issues are addressed on the following pages.

On September 18, 1995, the Committee reconvened to address the remaining 32 issues. A total of nine Committee meetings were held, with the last concluding on November 20, 1995. Committee recommendations on issues were forwarded to the Planning Commission for their recommendation. Then, both recommendations were forwarded to the Board of Supervisors for final direction.

Between October 2 and November 3, 1995, Sutter County also offered an opportunity for property owners with land located in the unincorporated portion of the County to submit requests for land use designation changes. The opportunity to submit requests for land use designation changes is a standard practice in the planning process when revisions are being considered to the land use diagram. A total of 38 land use designation requests were submitted.

In addition to issue resolution activities, this segment of the Comprehensive General Plan Revision also focused on the development of a "preferred land use alternative" for the County. Based on input received from the public, recommendations made by the Citizen's Advisory Committee and Planning

Commission, as well as direction given by the Board of Supervisors, three land use alternatives were developed and reviewed by the Planning Commission on December 4, 1995, and by the Board of Supervisors on December 5. These alternatives are described below.

Alternative 1 Alternative 1 proposed approximately 8,500 acres of industrial/commercial land uses in the south county area, an industrial/commercial corridor from Township Road to FPARC along Highway 20 of approximately 3,500 acres, and residential expansion of approximately 270 acres to the east and west of Sutter along with an approximately 40 acre section of commercial area south of Sutter.

Alternative 2 Alternative 2 proposed approximately 6,000 acres of industrial/commercial land uses in the south county area, approximately 1,400 acres of industrial/commercial areas located adjacent to FPARC and west of Township Road, and residential expansion of approximately 100 acres to the west of Sutter along with an approximately 40 acre section of commercial area south of Sutter.

Alternative 3 Alternative 3 proposed approximately 8,500 acres of mixed land uses in the south county area, approximately 1,100 acres of industrial area located adjacent to FPARC, approximately 1,100 acres of mixed use area west of Township Road along Highway 20, and an approximately 40 acre section of commercial area south of Sutter.

Following the December 5, 1995 Board meeting, a preferred alternative was developed. The preferred alternative proposed approximately 10,500 acres of industrial/commercial land uses in South Sutter County. However, the Board's final direction was to allow 3,500 acres of development for the 20-year planning period. Approximately 700 acres of industrial/commercial land uses along the north side of Highway 20 south of the community of Sutter, approximately 270 acres of low density residential and estates residential development adjacent to the community of Sutter, and several small parcels of proposed commercial land uses near the City of Yuba City. This preferred land use alternative was used as the focus of the environmental analysis, which served as the basis for development of the 1996 Draft General Plan and Draft Environmental Impact Report.

Some of the key issues that arose from the CGPR process and are addressed in the General Plan include:

1. Ranchette Development - One of the more divisive issues discussed throughout the CGPR process was that of Ranchette development. As part of the CGPR, the Board recommended creation of a new Ranchette (RAN) land use designation. This designation is intended to accommodate small farm/large lot residential areas in the agricultural regions of Sutter County. The Ranchette designation allows for expanded agricultural uses than what is allowed in the Estates Residential (ER) designation, but on parcels between 3 and 10 acres in size. Sutter County recognizes that there is a need to accommodate a wide range of housing opportunities and lifestyles, while still preserving agricultural lands. Therefore, the County will be establishing a process and criteria to allow this type of development with the least amount of impact on existing agricultural operations.

2. Economic Development - An often discussed topic throughout the "Issue Identification" and "Issue Resolution" phases of the CGPR was the need to increase employment opportunities in Sutter County and to promote Sutter County as a location for industrial and commercial development. As part of the CGPR process, approximately 3,500 acres of new industrial and commercial land uses were proposed in the south county area. Also proposed for industrial/commercial uses was approximately 700 acres of land along State Highway 20, south of the community of Sutter. The Board also directed that a ratio of 85% industrial and 15% commercial land use mix be used in these areas. This was to emphasize the goal of achieving higher paying industrial jobs.
3. Enhancement and Preservation of Agricultural Industry - Agriculture was identified as one of the dominant industries within Sutter County. As urban development increases, the need for further protection of the County's agricultural industry becomes more and more important. An implementation program was proposed within the new Plan that will require the County to develop a buffering program to reduce conflicts between agricultural and non-agricultural uses. The buffering program will include design and maintenance guidelines. Another proposed implementation program directs the County to study and facilitate, if appropriate, permanent agricultural preservation measures. Additional policies were suggested requiring that certain findings be made before allowing non-agricultural development of agricultural lands.

With regard to enhancing the agricultural industry, new policies were proposed that would support vertical integration (production, processing, and distribution) of agricultural industries within Sutter County. Also, the County will be making an effort to explore the feasibility of developing incentive packages that could be marketed to both existing and new agricultural industries.

4. Expansion of Rural Communities - The County General Plan currently identifies seven rural community areas with varying degrees of rural and suburban development. These communities have limited public facilities, services and infrastructure. These limitations present constraints to growth in these communities. Because of current pressures for growth, it was decided that the community of Sutter should be studied first, and that the remaining communities would be studied individually at a future time.

A Citizen's Advisory Committee meeting was held in the community of Sutter in October of 1995 to receive input from residents regarding growth in Sutter and the concept of expanding the community boundaries. The greatest constraint to growth in Sutter is its identified groundwater contamination problem, which may be attributed to the concentration of on-site sewage disposal systems on small lots, combined with the existence of individual wells. Residents of Sutter generally supported a limited amount of growth contiguous to the existing community; however, preserving the small town character was equally important. An emphasis was placed on completing infill development within the existing community before expanding outward. Because of the public health issue associated with the groundwater contamination, the County has restricted development at urban densities and the subdivision of new lands until such time as public water, sewer, and storm drainage facilities become available or are provided.

5. Residential Urban Services - Because the County does not have the facilities or resources to provide full urban services for new suburban and urban residential development, all new suburban/urban residential development within the unincorporated portions of Sutter County will be required to have full urban services that are provided by some entity other than the County. These services may include but not necessarily be limited to sewer, water, drainage, law enforcement, fire protection, parks/recreation facilities and programs, and public landscaping.
6. Land Use Planning within the Spheres of Influence - During the CGPR process, the City of Yuba City specifically expressed a desire to do all of the land use and facility planning within it's sphere of influence. The sphere of influence line functions as an urban service/boundary line, delineates the future expected jurisdictional boundary for a city, and often serves as a planning area for the purposes of land use. Just as the County has decided that it is no longer feasible for it to provide urban services for new suburban and urban residential development, it has also determined that land use planning within the Yuba City and Live Oak spheres of influence should be conducted by each respective city in coordination and cooperation with the County.
7. General Plan and Zoning Inconsistencies - The CGPR process included the redesignation of unincorporated lands throughout the County, however, concurrent rezoning was not conducted. California state law requires that County zoning ordinances be consistent with the general plan of the county. Sutter County recognizes that various inconsistencies exist in the unincorporated area between zoning and general plan land use designations. Resolution of these inconsistencies will begin following adoption of the general plan. The "General Land Use (unincorporated)" section of the Land Use Element contains policies and implementation programs that address this issue.

AREA PLANS

The Sutter County General Plan contains one area plan, known as the FPARC Area Plan. An "area plan" provides for the ultimate development of smaller subareas or communities within the county. The purpose of the area plan is to provide policy guidance tailored to the needs and conditions of a specific area.

FPARC Area Plan

With the passage of Measure A in 1982, Sutter County voters created the approximately 1,800 acre Food Processing, Agriculture and Recreation Combining (FPARC) Area Plan. The original purpose of the plan was to provide a place for a food processing plant, powered by a co-generation facility which utilized waste water from the processing facility to irrigate a golf course. The voter approved plan includes land area on the southern flanks of the Sutter Buttes as well as area south of South Butte Road and north of State Highway 20. Figure 2.1-2 shows the FPARC boundaries.

Previous Area Plans

Prior to the update of this document, there were four other area plans (Yuba City Urban Area Plan, the Live Oak Area Plan, the Tierra Buena Area Plan, and the South County Area Plan) that provided policy guidance specific to each area; however, as part of the General Plan Technical Update, these area plans were superseded. Current policies and standards address all areas of the County.

2.3 ZONING

SUMMARY OF ZONING DISTRICTS

As of March 1996, the Sutter County Zoning Ordinance provides for a total of 28 zoning districts. In general, zoning districts are a division of land into districts for the purpose of implementing a set of minimum standards dealing with the use of property and all regulations pertaining to buildings/structures. The Zoning Code includes "combining districts" which are districts not used by themselves, but when added to other zone districts, can provide specific additional uses and/or requirements. For example, adding the A (Agricultural) Combining District to the R-1 (Single Family Residential) District would result in a R-1-A District which would provide for the addition of certain limited agricultural uses such as keeping of animals (i.e. horses and cows) not normally permitted in a straight R-1 District. Table 2.3-1 identifies each zoning district and summarizes the primary uses occurring in each of the districts and the shortened map code used for reference.

Three zoning districts were established in prior years and have not been used to date in the County. The M-L (Limited Manufacturing) District was adopted in 1960 with most of the rest of the Sutter County Zoning Code to be used for business, profession, research and technical manufacturing uses normally found in business parks. The U-A (Upland Agricultural) District was created in the 1970's to apply to the Sutter Buttes area. Also in the 70's the A-3 (Restrictive Agricultural) District was created to apply to those areas in the County with intensive agricultural activities and where urban encroachment was to be discouraged.

In 1995, the R-3 (Neighborhood Apartment) and R-4 (General Apartment) Zoning Districts, which are primarily designed for medium and high density residential uses, were modified to not allow single-family or two-family residences unless parcel size prevents the use of the property for any other residential use. These changes were made to comply with Housing Element language. Specifically, Policy 2.2 and Implementation Measure 2.2.4.

Another significant change to occur in 1995 was to the C-1 (Neighborhood Commercial), C-2 (General Commercial), C-3 (Commercial/Industrial), M-1 (Light Industrial), M-2 (General Industrial), and M-L (Limited Industrial) Zoning Districts. These districts had all contained provisions for residential uses subject to obtaining a use permit; however, now the only residential use allowed is for a caretaker unit as an accessory to a permitted on-site existing use.

As part of the Comprehensive General Plan Update, a new Ranchette (RAN) land use designation was developed. A new consistent zoning district will be developed as part of the County's comprehensive Zoning Code update immediately following the adoption of this General Plan.

TABLE 2.3.1
ZONING DISTRICTS

AGRICULTURAL		
DISTRICT NAME	PRIMARY ACTIVITY	MAP CODE
Upland Agricultural District	Agricultural district with general 80 acre minimum parcel size intended to be applied in the mountainous and foothill areas of the County in which light agriculture and grazing are desirable predominant uses. Churches and utility uses allowed by use permit.	U-A
Exclusive Agricultural District	Agricultural district with general 20 acre minimum. Agricultural commercial activities, churches and gun clubs allowed by use permit.	A-2
General Agricultural District	Agriculture and agricultural processing and support services and gun clubs generally allowed on 20 acre parcel. Expanded agricultural commercial and support activities allowed by use permit.	AG
Restrictive Agricultural District	Agriculture and agricultural housing and gun clubs generally allowed on 20 acre parcel. Churches and accessory agricultural activities allowed by use permit.	A-3

RESIDENTIAL		
Residential Estates District	Allows single-family residences, private stables, nurseries and agricultural activities except for the raising of animals for commercial purposes.	R-E
One Family Residence District	Allows single-family residences, crop and tree farming except commercial nurseries and public parks and schools. Residentially compatible additional uses allowed by use permit including hospitals, rest homes, churches and golf courses.	R-1
Two Family Residence District	Allows duplexes in addition to all uses allowed in the R-1 District. Allows by use permit all uses allowed by use permit in the R-1 District.	R-2
Neighborhood Apartment District	Allows group dwellings, multiple-family housing projects, apartments and boarding and lodging houses. Allowed uses also include those allowed in the R-1, R-2, and R-3 Districts, except for single-family or two-family residences unless parcel size prevents the use of the property for any other residential use.	R-3
General Apartment District	Allows hotels, hospitals, churches, private schools and day care centers, mortuaries, professional offices, clubs and lodges and mobile home parks along with those uses allowed in the R-1, R-2 and R-3 Districts, except for single-family or two-family residences unless parcel size prevents the use of the property for any other residential use.	R-4

COMMERCIAL		
Highway Service Commercial District	Allows gasoline service stations, motels, restaurants, trailer courts, nurseries and agricultural produce sales along with all uses allowed in the R-3 District.	CH
Neighborhood Commercial District	Allows food sales, book stores, drug stores, small appliance repair shops, gasoline service stations, laundries, barber shops and beauty salons. Also allows caretaker units as an accessory to a permitted on-site existing use.	C-1
General Commercial District	Allows retail sales and business or service enterprises similar to the following: banks, business offices, bowling alleys, clothing stores, print shops, music or dance studios and sales, restaurants and caterers, small bakeries, mortuaries and all uses allowed in the C-1 District, except that gasoline service stations and caretaker units accessory to a permitted on-site existing use requires a use permit.	C-2
Commercial Industrial District	Allows all commercial uses, including warehousing, except for those that are specifically allowed only in the M-1 or M-2 Districts. Also allows caretaker unit as an accessory to a permitted on-site existing use.	C-M

INDUSTRIAL		
Light Industrial District	Allows assembly and storage of goods and materials when enclosed in a building or yard, manufacturing, processing and fabricating of goods, material or produce except operations involving fish fats or oils and bone and meat products. Allows retail feed, fuel and lumber yards when screened with an approved fence. Allows all uses as allowed in the C-M District except adult entertainment uses.	M-1
General Industrial District	Allows wholesale lumber yard and lumber mills, pottery kilns and ceramic works, concrete batch plants, gravel, rock and cement materials yards, foundries and commercial feed lots. Allows all uses as allowed in the M-1 District except that hotels require a use permit. By use permit, allows all uses not otherwise specified in the Zoning Code.	M-2
Limited Industrial District	Allows professional and commercial offices, electronic manufacturing and assembly, cartography, editorial and design firms, garment manufacturing and paper products manufacturing.	M-L

MISCELLANEOUS		
Food Processing, Agricultural, Recreational Combining District	Food and fiber processing plants and accessory uses, public and private recreational facilities including golf courses, general farming and agricultural uses, land leveling contractors, single-family residence, gun clubs, nurseries, repair and storage of land leveling equipment. By use permit the following are allowed: sale, repair and storage of farm equipment, sale and storage of agricultural supplies, commercial feed lots, agricultural auctions, churches, schools, agricultural truck yards and retail, commercial and service facilities including restaurants, gasoline stations, and other facilities to support the food processing and recreational facilities.	FPARC
Mobile home Subdivision District	Allows one residential mobile home per lot with accessory structures and allows crop or tree farming.	M-H-S
Airport District	Aircraft fueling, storage, service and repair, passenger and freight terminals, paved aircraft runways, taxiways and aprons and airport accessory facilities.	AV
Park-Recreational District	Allows public parks and playgrounds, private golf courses, boating, swimming, fishing, gun clubs and riding facilities and crop and tree farming. Allows by use permit motels, trailer parks, restaurants, food, drug and sporting goods store, hospitals, schools, and day care facilities.	PR

COMBINING DISTRICTS		
Agricultural Combining District	Allows the keeping of large, medium and small domestic animals and the sale of agricultural produce grown on the property. Allows by use permit the keeping of hogs, veterinary clinics and hospitals and the retail sales of nurseries stock.	A
Special Building Site Combining District	Modifies lot size and side-yard setback requirements.	B
Special Civil District Combining District	Allows public buildings and grounds, but requires Planning Commission review of building permits for new structures.	CD
Special Flood Plain Combining District	Allows recreational, commercial and industrial uses when directly related to water borne activities. Also allows modification of structure height by use permit and requires residential uses to be located above specified flood heights.	FP
Special Height Combining District	Specified maximum height allowed for any structure or building on the subject property.	H
Combining PD Combining Planned Development District	Most comprehensive of all combining districts. Requires adoption of a development plan for the subject property and allows modification of all site development standards along with additional uses.	PD
Special Highway Frontage Combining District	Places special sign related requirements on the subject property. Requires a minimum 20 feet front yard setback.	S
Trailer Combining District	Allows residential use of mobile homes.	T

2.4 EXISTING UNINCORPORATED AREA LAND USE

COUNTY LAND USE

Of the County's 388,358 acres of land, the majority is utilized for agricultural purposes. Table 2.4-1 shows the gradual trend decreasing the total amount of agriculturally zoned land in the unincorporated area since 1985.

Table 2.4-2 shows the percent of total land area zoned for agricultural and non-agricultural uses. This table shows that even with the decrease in land zoned for agricultural use, 96.9% of the total land area in Sutter County and 98.2% of the unincorporated area is still zoned for agricultural use. Note: lands zoned for agriculture are not necessarily used for agricultural production.

TABLE 2.4-1**AGRICULTURAL LAND CONVERSION**

	Agriculturally Zoned Land in Acres				Net Acreage Change
	1985	1990	1995	1996	1985-96
Total County Area	388,480	388,480	388,358	388,358	-122
Incorporated Area	4,426	5,330	6,579	6,825	+2,399
Unincorporated Area	384,054	383,150	381,779	381,533	-2,521
Unincorporated Non-agriculture	5,150	5,375	5,454	5,410	+260
Total County Non-agriculture	9,576	10,705	12,033	12,235	-2,659
A-2 Zoned Area	10,102	10,102	10,098	10,098	-4
FPARC Zoned Area	1,800	1,800	1,800	1,800	0
AG Zoned Area	367,002	365,873	364,427	364,225	-2,777
TOTAL AGRICULTURALLY ZONED LAND	378,904	377,775	376,325	376,123	-2,781

Source: Sutter County Community Services Department

TABLE 2.4-2**COMPOSITION OF COUNTY LAND USE
AS A PERCENT OF COUNTY TOTAL**

	Percent of County Total			
	1985	1990	1995	1996
Sutter County Total				
Zoned Agricultural	97.5%	97.2%	96.9%	96.9%
Zoned Non-Agricultural	2.5%	2.8%	3.1%	3.1%
Unincorporated County Area				
Unincorp. Zoned Agricultural	98.9%	98.6%	98.3%	98.2%
Unincorp. Area Zoned Non-Agricultural	2.1%	2.4%	2.7%	2.8%

Source: Sutter County Community Services Department

2.5 CITY GENERAL PLANS

As stated in Section 2.1, Sutter County has two incorporated cities, each with its own General Plan to guide development within its boundaries. The following discussion describes the size, character and briefly summarizes the provisions of each City's General Plan and County-wide land use and development issues.

City of Yuba City

The City of Yuba City is located in the northeastern portion of Sutter County, about 40 miles north of Sacramento and 46 miles south of Chico. The City area lies west of the Feather River, straddling State Route 99, which runs in a north-south direction. State Route 20, which runs east-to-west, intersects State Route 99 near the geographic center of the City.

Yuba City was incorporated in 1908 and has served as a rural farm service center until the post-Korean War era. Although still a rural area, suburban growth during the 1950's and 1960's changed the character of the community to the primary urban center surpassing the City of Marysville in population and total annual retail sales. During the Gold Rush days of the 1850's, Marysville had been the population and economic center of the Yuba-Sutter Bi-County region. A summary of Yuba City's population growth is contained in Table 2.5-1.

TABLE 2.5-1

HISTORICAL YUBA CITY POPULATION

Year	1910	1920	1930	1940	1950	1960	1970	1980	1990	1995
Pop.	1,160	1,708	3,605	4,968	7,861	11,507	13,986	18,736	27,437	34,342

Source: U.S. Census and Department of Finance estimate

Yuba City is relatively flat with no significant elevation variations. The City has historically been surrounded by profitable orchards due to its flat topography and good alluvial soils. Expansion of the City boundaries occurs via annexations of land contained within the City's Sphere of Influence established by the Sutter County Local Agency Formation Commission (LAFCO). City expansion over the last decade has generally occurred in a north-south direction through the existing orchards; however, 1989 and 1990 LAFCO actions reduced the area for expansion in the north-south directions and could direct future City development westward into non-orchard lands. The current Sphere of Influence, as adopted by LAFCO, is Pease Road on the north, Township Road on the west and Bogue Road on the south except for an area along Garden Highway south to near Stewart Road and the Feather River on the east. (See Figure 2.7-1).

In 1989, the City adopted a new General Plan with a total land area of approximately 18,300 acres and a total holding capacity of about 80,000 people. The Plan contains 35 basic goals, the first two of which are "Preservation of agricultural lands" and "Conservation of resources". The Plan proposes to achieve these and the other 33 goals with the establishment of an urban boundary and to contain non-agricultural development and a requirement that new development inside the boundary is provided with full services. The urban services requirement allows the intensity of development to be maximized and discourages development that would skip over large parcels/areas of land ("leap-frog" development), providing for more orderly and efficient growth.

City of Live Oak

As of January 1995, the City of Live Oak contained 1.8 square miles with an estimated population of 5,312 people. The City is located along State Highway 99 in the northeast section of Sutter County approximately 6 miles north of Yuba City. The City was incorporated in 1947 and served as a rural service center for the surrounding agricultural area and serves the same primary function today. Population growth since incorporation is summarized in Table 2.5-2.

TABLE 2.5-2
HISTORICAL LIVE OAK CITY POPULATION

Year	1950	1960	1970	1980	1990	1995
Pop.	1,770	2,276	2,645	3,103	4,320	5,312

Source: U.S. Census and Department of Finance estimate

City development has been relatively equal in all four directions (north, south, east, west). Live Oak is flat with less than two percent grade and is within an orchard belt characterized by good alluvial soils which extends westward from the Feather River. As of May 1996, Live Oak's Sphere of Influence extends from the Butte County line on the north, Township Road on the west, Paseo Avenue on the south and the Feather River on the east. (See Figure 2.7-1.)

In 1993 the City of Live Oak completed a new General Plan to replace the 1979 General Plan. By 1993, the City had surpassed the 1979 planning area boundaries on both the east and the west sides of the City though additional area within the planning area boundaries still existed on the north and the south sides. The General Plan projects a total City population of 21,402 by the year 2010 if full build-out of the proposed land use plan were to occur; however, SACOG projects a population of 8,210 by the year 2010 based on current growth rates.

2.6 PHYSICAL FORM AND URBAN DEVELOPMENT

PHYSICAL FORM AND VISUAL CHARACTER

This section describes the structure and appearance of Sutter County's physical environment. The physical environment is a key component in planning for future county growth since it contributes directly to the perceived desirability of the county as a place to live and work. This, in turn, has consequences for the economic vitality of the county in that it affects the types and quantity of businesses and residents that ultimately will settle in Sutter County. For this reason, it is important to consider issues of form and character when considering the formulation of the County's land use policies.

The concept of "physical form" encompasses the physical qualities of a place at different scales: regional, sub-regional, and local. In addition, individual perception of the county's form and character is influenced by context and intent. For example, individual sense of physical form can be influenced by the way a region appears on a map, by sub-regional geographic features observed during automobile travel, or by architectural qualities observed when walking a local neighborhood street. All three experiences contribute to the sense of the County as a unit.

Sight is the dominant sense used to identify physical features in the environment, but the mental pictures or images we form of the places in which we live, work or travel are not objective images like photographs. A sense of place is subjective; perceptions are colored by values, intentions, and intellect. People tend to remember the environment because of elements of contrast or change that mark the landscape and make it distinctive. For example, the openness and flatness of the valley floor made memorable (i.e., distinctive) by the visibility of distant features such as the Sutter Buttes and the Coast Ranges. Memorable characteristics can be positive or negative in their effect. For this reason, the visual quality and character of a place is often referenced in discussions of physical form.

COMPONENTS OF PHYSICAL FORM

Physical form and visual character are the result of the interaction of natural and man-made elements. Natural elements, including topography, hydrology, vegetation, and climate, create the basic physical context. Man-made elements, including buildings, roads, infrastructure, and settlement patterns, are secondary elements that act upon the natural context to establish a particular physical or visual environment. While planning cannot significantly alter the natural context, it can do much to influence the interaction between the natural and the man-made, and help to establish a balance which enhances the quality of life for County residents and visitors. The following discussion examines in more detail the natural and man-made components and describes their contribution to the County's form and character.

BOUNDARIES

Sutter County is located in the north central portion of the Sacramento Valley. It's boundaries were first established in 1850 as part of the original partition of California into twenty-seven counties. In 1851 the County's boundaries were redrawn to their current configuration, with the exception of a small 122.47-acre county boundary change with Yuba County along the Bear River in 1994.

On a map, the outline of Sutter County is primarily north-south in orientation with an eastern spur at the southern end. It is bounded by Yolo and Colusa Counties to the west with the Sacramento River and Butte Slough forming the western boundary; Butte County to the north; Yuba and Placer Counties to the east with the Feather and Bear Rivers forming the eastern boundary; and Sacramento County to the south. From major entries to the north and south, the County line does not coincide with any change in character from the adjoining counties; however, the east and west boundaries reflect natural features (rivers).

NATURAL FEATURES

In the rural setting of Sutter County, geographic features including the Sutter Buttes; the Feather, Sacramento and Bear Rivers, and associated levee system; localized drainage courses; oxbow lakes; the Butte Sink; and the expansive valley floor give shape and profile to the natural environment. Climate, vegetation and geography interact to differentiate sub-regional landscape units within the larger environmental context. The County can be divided into two major geographic units: the valley and uplands. The following discussion identifies six major categories of natural features which contribute to the overall visual and scenic quality of Sutter County based upon soil types, vegetation and topography: 1) Uplands, 2) Dissected Uplands, 3) Valley Orchards, 4) Valley Floor, 5) Butte Sink and 6) Riparian.

Uplands

The uplands consist of land ranging in elevation from approximately 100 feet mean sea-level up to the highest elevation in Sutter County (2,117 feet). The only land areas in the County reaching upland elevations are located in the Sutter Buttes. There are approximately 32,000 acres of uplands in the Sutter Buttes. The majority of uplands in Sutter County are covered by oak woodlands and valley grasslands consisting of tall trees with scattered brush and grassland between the trees. The periphery of the upland area contains open grasslands generally used for agricultural purposes. Several vernal pools have been inventoried on the State of California's Department of Fish and Game's Natural Diversity Data Base. These pools are generally located in the southwestern and eastern portions of the Sutter Buttes.

The Sutter Buttes are volcanic in origin with many interesting and significant rock out-croppings. These upland areas contain shale, sandstone and soft sandstone. Upland soils are generally shallow with underlying fractured bedrock near the surface. Some small pockets of deeper soil are located in the canyon floor areas between ridges. The primary land use activity in the uplands is grazing with some more intensive agricultural uses located in the pocket areas. Four open-pit mines are located in the Buttes. Mined mineral is primarily used as material for construction base. The 1972

Sutter County Conservation Element contained an agricultural land capability map showing the majority of the uplands area not suitable for cultivation. The land capability map was prepared from the U.S.D.A. Soil Conservation Service's capability classification of soil types.

Dissected Uplands

The classification "dissected uplands" is from the Agricultural Land Capability Map prepared for the 1972 Sutter County Conservation Element. It applies to the southeastern part of Sutter County adjacent to Placer County. Dissected uplands are characterized by open grass lands with some row or field crops and with a slight rolling terrain where the land has been eroded by various streams and creeks running through it. The soils have a slow permeability and have difficulty complying with regulations for septic system design. Although generally medium to deep soils, the area contains a hard pan layer at or near the surface to give it the slow permeability. The area identified as dissected uplands in Sutter County has several dairies, stables and cattle ranches.

Valley Orchards

The valley orchards are characterized as having some of the best soils in Sutter County. Soils are alluvial in origin having been laid down by countless flooding of the Sacramento, Feather and Bear Rivers. Valley orchards are located relatively close to Sutter County's rivers and are typically flat with slopes of generally less than two percent. The primary orchard crops in Sutter County based on acreages harvested are prunes, walnuts, peaches and pears. Soil types contained in valley orchards are considered to be the best of the soil classification types according to the U.S.D.A. Soils Conservation Service.

The valley orchards have encountered the most significant urban intrusion due to the proximity of valley orchards to the urbanizing areas. Historically, urban development has occurred at the confluence of rivers in the County; e.g., Yuba City, Nicolaus, Rio Oso and Meridian. These locations also happen to be the locations of the valley orchard areas. Any enlargement of Yuba City north, south, and to a lesser extent west, has been and continues to be into valley orchards. As the County's agricultural community grew, other agricultural service centers developed in locations having transportation crossroads; e.g., Live Oak, Robbins, Sutter and East Nicolaus.

Valley Floor

The valley floor is a large area of Sutter County which is characterized by flat topography and open row or field crop type agricultural uses. This is the largest single physiographic area in Sutter County. Generally, the valley floor runs from the Butte County line on the north southward in a relative narrow band until reaching the southern side of the Sutter Buttes. South of the Buttes the valley floor widens to encompass the area between Township Road and the community of Meridian. From Highway 20, it runs south southeast encompassing the Sutter Basin to the confluence of the Feather and Sacramento Rivers. Another band of the valley floor area runs northward from the Sacramento County line, through the remainder of the North Natomas Basin, along Highway 70 almost to the Bear River.

The valley floor has an extremely low population density and is dominated by large scale farming operations. Primary crops based upon total acreage are rice, wheat, beans, tomatoes and various types of hay. Soil types are categorized as being moderately good by the U.S.D.A. Soil Conservation Service.

Butte Sink

The Butte Sink is located in the northwestern portion of Sutter County, east of Butte Slough, west of the 50 foot mean sea level contour (which is west of West Butte Road), north of Pass Road and south of the Butte County Line. The butte sink is a wetland, subject to annual flooding from the Sacramento River and Butte Slough with summer drought.

Vegetation in the Butte Sink is generally oak woodland. Some of the area contains species typified in a fresh water marsh environment. Due to the winter flooding which occurs in the Butte Sink, the area is used extensively for waterfowl hunting. Hunting clubs and related facilities are scattered throughout the area. Some agricultural activity is located in the area while other properties are being allowed to revert to natural conditions for hunting operations. In recent years, the U.S. Fish and Wildlife Service has been actively acquiring conservation easements in the area to maintain and improve waterfowl habitat.

Riparian

The riparian areas are those very narrow bands of wetland habitat adjacent to the rivers and streams in Sutter County. The streamside natural communities are characterized by the abundance of water, shade and dense cover. Trees and understory are either dense or widely spaced in clumps. Riparian areas are the most popular wildlife habitat in the area due to the availability of water, food, protection from the sun and large scale human disturbance. Threats to riparian areas are generally from flood protection measures conducted within the levees, pollution, recreational activities and agricultural uses.

2.7 LAFCO AND SPHERE OF INFLUENCE

LAFCO RESPONSIBILITIES

In 1985, the Cortese/Knox Local Government Reorganization Act (Government Code Section 56000) consolidated the various state laws regulating city and special district organization and annexations. The Cortese/Knox Act superseded the 1963 Knox-Nisbet Act, which created local agency formation commissions (LAFCOs) in each county in California to regulate the organization and extension of services provided by cities and special districts.

The Knox-Nisbet Act declares that "among the purposes of the commission are the discouragement of urban sprawl and encouragement of the orderly formation and development of local agencies based upon local conditions and circumstances. One of the objectives of the commission is to make studies and to obtain and furnish information which will contribute to the logical and reasonable

development of local agencies in each county so as to advantageously provide for the present and future needs of each county and its communities" (Government Code Section 56301). In meeting these responsibilities, each LAFCO is required "to review and approve or disapprove, with or without amendments, wholly, partially, or conditionally, proposals for changes of organization or reorganization" [Government Code Section 56475(a)].

According to Government Code Section 56201, "change of organization" means any one of the following while a reorganization is any combination of the following:

- A city incorporation;
- A district formation;
- An annexation to, or detachment from, a city or special district;
- A disincorporation of a city;
- A district dissolution; and
- A consolidation of cities or special districts.

Government Code Section 56036 defines the special districts that fall under LAFCO jurisdiction. School districts and redevelopment agencies, among others, are not included within this definition and are therefore not subject to LAFCO review.

In addition to its regulatory responsibilities, LAFCO is empowered to initiate and make studies of existing governmental agencies. These studies include, but are not limited to, inventories of local agencies and determination of their maximum service areas and service capabilities. LAFCO also has the authority to initiate specific applications to consolidate special districts.

SPHERES OF INFLUENCE FOR THE CITIES

As the basis in part for decision making in organizational changes and annexations, LAFCO is required to adopt a "sphere of influence" (SOI) for each local agency subject to LAFCO regulation. The Cortese-Knox Act defines a sphere of influence as "a plan for the probable ultimate physical boundaries and service area of a local agency" (Government Code Section 56076). In practice, "ultimate" is typically defined as 20 years. The SOI determination includes the identification of "Urban Service Area" (USA) boundaries, which identify areas within a city's sphere of influence that are served by urban facilities, utilities, and services or that are proposed to be served during the first five years of an adopted capital improvement program. These boundaries must be adopted in cooperation with the affected cities. Once LAFCO adopts the boundaries, it may not deny a city's annexation of land that falls within an identified "urban service area boundary." Sutter County LAFCO has not adopted the USA concept for the City of Live Oak or Yuba City since neither City normally includes extra-territorial area in its capital improvement planning nor has either city or LAFCO itself initiated the USA process.

In determining the SOI of each local agency, LAFCO must consider and prepare a written statement of its determinations with respect to each of the following:

- The present and planned land uses in the area, including agricultural and open space lands;
- The present and probable need for public facilities and services in the area;
- The present capacity of public facilities and the adequacy of services which the agency provides or is authorized to provide; and
- The existence of any social or economic communities of interest in the area if the commission determines that they are relevant to the agency.

Once these spheres are adopted, LAFCO decisions must be consistent with applicable spheres (Government Code Section 56377.5). This means that LAFCO may not approve annexations to a local agency of territory located outside of that agency's SOI.

SPHERES OF INFLUENCE

The first SOI that was adopted was for the City of Yuba City in 1980. The first Yuba City SOI included only that area shown within the 1978 Yuba City Urban Area General Plan containing approximately 8,000 acres.

Yuba City's SOI was amended in 1986 to include all of the Yuba City Urban Area including the Tierra Buena Area and the Yuba City Urban Area Fringe (approximately 19,350 acres). The northern boundary of this area was Pease Road, Township Road to the west, Oswald Road to the south and the Feather River to the east. In 1990 the Yuba City SOI was amended. LAFCO deleted the area between Bogue and Oswald Road. The deleted area contained approximately 5,350 acres of land which is primarily used for agricultural activity. Today, over 14,000 acres are within the Yuba City SOI. Figure 2.7-1 identifies the existing boundaries for both the City of Yuba City and the City of Live Oak.

The City of Yuba City provides full urban services to property located inside the city limits with the exception of area-wide drainage which is generally provided by the Gilsizer County Drainage District. Yuba City also provides water and sanitary sewer services to some unincorporated areas which are located near their service mains. Unincorporated properties which receive utility service from the City are required to pay twice the monthly utility rate paid by City rate payers. The principal area of unincorporated utility service by the City is located along Walton Avenue from Bogue Road to just north of Lincoln Road. The City requires that property owners receiving city utility services agree to be annexed upon the City's request.

Some areas within Yuba City's unincorporated SOI receive utility service by other providers. The Hillcrest Water Company, a private company, provides domestic water service to a large area. Several small mutual water companies also provide water to individual subdivisions.

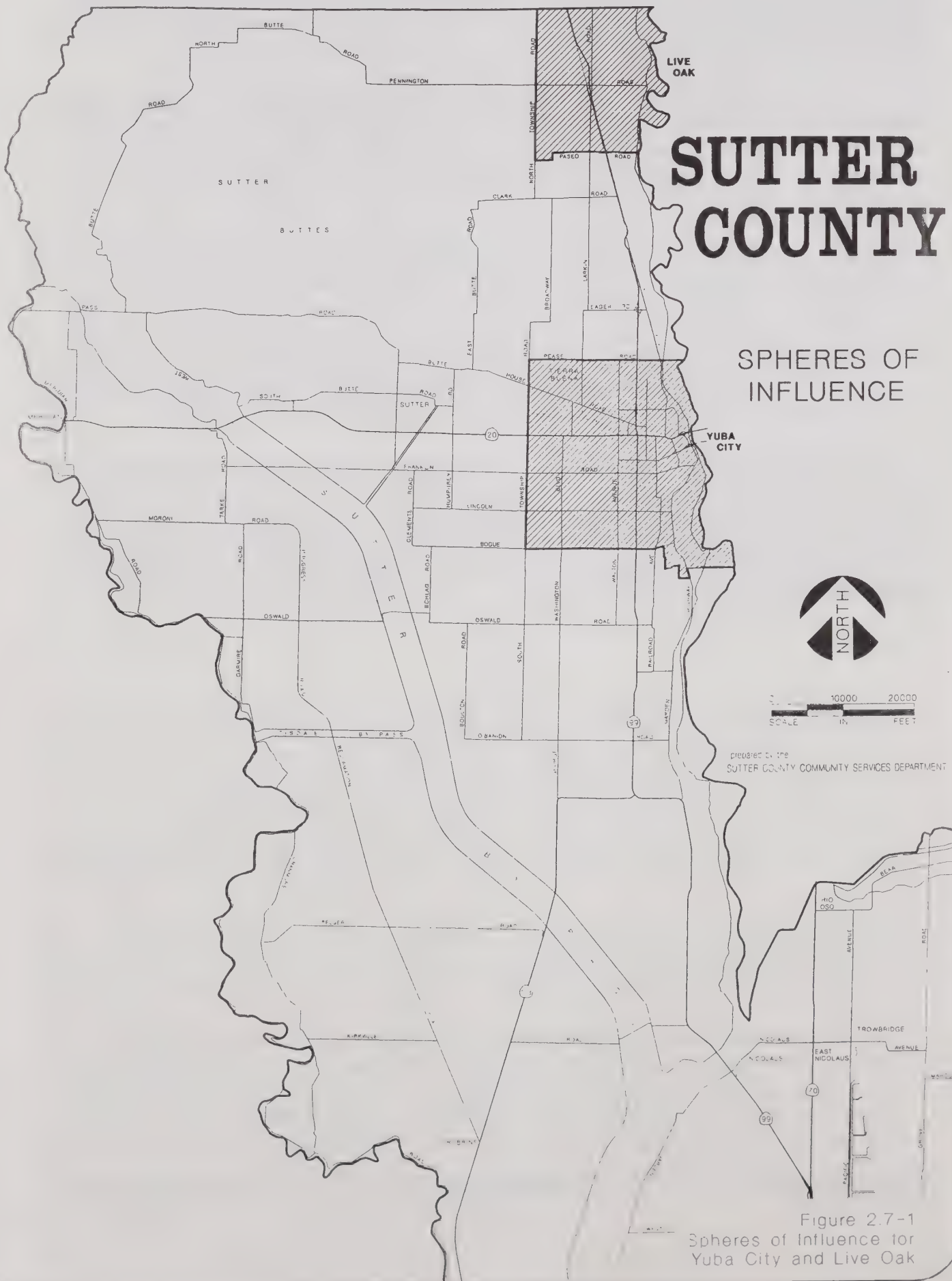
The Tierra Buena Community Services District was formed in 1992 to provide sewer service to the Stonegate Subdivision in Tierra Buena. This subdivision contains 104 lots and is located in the Yuba City SOI. In 1993, Sutter County received two development applications proposing eventual annexation to the CSD. In 1990, during the last revision of the Yuba City SOI, the City indicated the ability to expand its sewerage treatment plant to serve the entire Tierra Buena Area. The

expansion would require the extension of a sewer main from it's present location at the intersection of Bogue Road and Railroad Avenue, westward and northward, approximately six miles to the southern boundary of the Tierra Buena Area.

In 1993, AB-1335 (Gotch Bill) was approved and amended the Cortese-Knox Act. One requirement of that Act is that now LAFCO must approve the provision of outside services for any local agency which provides those services outside of it's boundary. The amendment has a provision which allows the continuation of services for those properties receiving service prior to January 1, 1994; however, all new services must be approved by the commission.

The City of Live Oak SOI was adopted in 1984 and has not been amended since. The boundary for the SOI was set at the Butte County line on the north, Township Road on the west, Paseo Road on the south and the Feather River on the east. Total area for the Live Oak SOI is approximately 7,200 acres. The existing incorporated City contains approximately 1,150 acres. The City of Live Oak provides sewer and water services and contracts with the County of Sutter for police and fire services. Unlike Yuba City, Live Oak does not provide outside utility services to properties located in unincorporated areas. Drainage in the area is provided by Reclamation District 777.

Fire service for Live Oak is contracted from Sutter County via County Service Area "A." The contract under which the County is reimbursed for fire services to Live Oak, was developed in the mid-1970's. It provided for the separation of different types of costs and repayment based upon the 1977 ratio of Service Area "A's" population to the City of Live Oak population. This contract has lead to a reimbursement equality problem by 1994 which needs to be addressed in order to properly fund fire services for the area.



SUTTER COUNTY

SPHERES OF INFLUENCE



10000 20000
SCALE IN FEET

prepared by the
SUTTER COUNTY COMMUNITY SERVICES DEPARTMENT

Figure 2.7-1
Spheres of Influence for
Yuba City and Live Oak

2.8 OTHER COUNTY AND REGIONAL PLANS

SACOG AND REGIONAL PLANS

Sutter County is a member of the Sacramento Area Council of Governments (SACOG), a regional council of governments composed of the following counties and the cities within them: Sacramento, Yolo, Yuba and Sutter Counties. The cities of Lincoln, Rocklin and Roseville in western Placer County are also members of SACOG. SACOG's governing board is composed of a representative from each of the county board of supervisors and each city council of its member cities. SACOG has five major functions:

1. As a Regional Transportation Agency, to administer the requirements of the federal Transportation Development Act and to develop and adopt (a) a Regional Transportation Plan, which describes policies, strategies and existing and proposed facilities; and (b) a Regional and Federal Transportation Improvement Program, which is a staged, multi-year program of transportation improvement projects consistent with the Regional Transportation Plan.
2. To develop a Regional Housing Allocation Plan.
3. To act as the Airport Land Use Commission and set policies for and review proposals for development around the region's airports, including the adoption of a Comprehensive Land Use Plan for each of the area's airports.
4. To review the transportation plans and programs of member agencies and endorse them based upon their satisfaction of regional need and their consistency with adopted regional plans and policies.
5. To serve as an area-wide clearinghouse for projects proposed for federal funding assistance.

SACOG is responsible for preparing and adopting Regional Transportation Plans which review issues related to aviation, movement of goods, highways, mass transit, non-motorized transportation and transportation system management. The Regional Transportation Plan addresses transportation related issues and concerns and creates a series of goals with objectives and policies/actions to guide transportation decisions, proposes a program of capital operational and management improvements needed for a specific time period, and recommend a package of revenue increases to fund the proposed program.

As part of its planning services related to transportation, air quality and other matters, SACOG prepares population, housing and employment projections for all jurisdictions and sub-areas of the region. The projections are usually based upon the State Department of Finance's County projection series. SACOG uses this series along with input from local representatives to create the sub-area or minor zone projection series.

SACOG acts as the Airport Land Use Commission (ALUC) for the counties within its region. As such, it is responsible for the preparation of a Comprehensive Land Use Plan (CLUP) for the areas surrounding the region's public airports, including the Sutter County Airport. SACOG prepared a CLUP for the Sutter County Airport that was adopted on April 4, 1994.

SACOG prepares the Regional Housing Allocation Plan which forms the basis for the County's share of the regional housing need for each city and the unincorporated area in Sutter County. The portion of the Regional Housing Allocation Plan for Sutter County is based upon housing needs of the Yuba City Metropolitan Statistical Area which is composed only of Yuba and Sutter Counties, and not the entire SACOG region. The intent of the Plan is that over a period of years, the distribution of households in all income groups should be equalized among all jurisdictions. The Housing Element further discusses the Regional Housing Allocation Plan.

INTEGRATED WASTE MANAGEMENT PLAN

Upon the passage of the California Solid Waste Integrated Waste Management Act of 1989 (AB939), which substantially changed requirements for waste management planning, Sutter County in conjunction with Yuba County, Yuba City, Live Oak, Marysville, Wheatland, and the City of Gridley in Butte County, began the preparation of the newly required components of an Integrated Waste Management Plan (IWMP). Required components of the Plan include: a Source Reduction and Recycling Element ; a Household Hazardous Waste Element , a Non-Disposal Facilities Element ; a Bi-County Siting Element; and the Regional Agency Integrated Waste Management Plan (summary of all four documents). The State has established time frames for the completion of various stages of the IWMP.

HAZARDOUS WASTE MANAGEMENT PLAN

The goals of the Hazardous Waste Management Plan reflect the County's intent to reduce the need for additional hazardous waste disposal sites by reducing the amount of waste generated. Goals related to waste reduction include minimizing waste at its source, recycling waste, and reducing the quantity of hazardous substances used. Goals related to public health and safety focus on properly treating waste that cannot be reduced, ensuring safe transportation of waste on the key transportation routes, and enabling the siting of community collection stations to contribute to proper handling of the County's hazardous waste.

AIR QUALITY PLANS

Air quality plans in Sutter County are carried out by local, regional, State and Federal agencies and organizations. The planning activities focus on attaining compliance with the Federal Clean Air Acts of 1977 and 1990 and the California Clean Air Act of 1988 as amended in 1991. At the local level, the agency responsible for planning activity is the Feather River Air Quality Management District (FRAQMD). They are responsible for preparing rules and regulations which limit emissions from stationary, area, and mobile sources.

At the regional/state level, SACOG prepared a federally required State Improvement Plan (SIP) in conjunction with all the air quality districts in the region, which was adopted in 1994. This document was submitted to the EPA as one comprehensive document for the entire Air Quality Management Area.

2.9 STATE AND FEDERAL AGENCIES CONCERNED WITH LAND USE

A wide range of State and Federal agencies exercise some level of regulatory control over land use decisions in Sutter County, some through permitting or review authority and others through ownership of land.

AGENCIES WITH PERMITTING AUTHORITY

The State Lands Commission has exclusive jurisdiction over all submerged lands owned by the State as well as the beds of navigable rivers, sloughs and lakes. The Commission has the authority to grant three kinds of permits: (1) mineral extraction leases; (2) dredging permits (required for any dredging of navigable waterways for improvement of navigation, reclamation and flood control); and (3) land use leases (required for any proposal to utilize navigable waterways for any purpose other than dredging, e. g., piers, floats, docks).

The State Reclamation Board maintains jurisdiction over all Federal Flood Control Projects and levees that are either part of such a project or that may affect such a project. The Reclamation Board is authorized to grant encroachment permits for any activity proposed along or near flood control levees, including changes in land use, construction, earthwork, or removal of vegetation.

The State Department of Fish and Game (DFG) has jurisdiction over "all water of the state", including any lakes, streams or rivers containing fish or wildlife resources. In Sutter County, such resources include the Sacramento, Feather and Bear Rivers and all natural streams, creeks and drainageways leading to said rivers. The DFG has also claimed authority over other local drainage facilities. The DFG has authority over two permitting processes: (1) streambed alteration agreements, required for any project that alters the flow of any lake, stream or river on the state; and (2) suction dredging permits, required for projects involving suction or vacuum dredging activities in state waters. The DFG also operates the Gray Lodge Waterfowl Management Area, several units of the Feather River Management Area, and other properties in Sutter County for the betterment of wildlife enjoyment.

The Regional Water Quality Control Board (RWQCB) maintains jurisdiction over discharges into all rivers, creeks, streams and canals. Their agency also has jurisdiction over groundwater quality. Any project that will discharge wastes into any surface waters must conform to waste discharge requirements established by the RWQCB. These requirements serve as the Federal National Pollution Discharge Elimination System (NPDES) permit. The RWQCB also works to obtain coordinated action in water quality control, including prevention and abatement of water pollution and nuisances.

The State Department of Transportation (CALTRANS) has authority over all state highway and freeway rights-of-way, including easements, and undeveloped rights-of-way that have been acquired in anticipation of future construction. Any project that proposes to construct a road connection or perform earthwork within a state highway or freeway must obtain an encroachment permit from Caltrans.

The State Board of Mines and Geology, Division of Oil and Gas, reviews applications for and issues permits for the exploratory drilling of gas or oil wells in Sutter County. Also the division reviews and issues permits for injection wells for the disposal of liquid waste from the gas and oil well drilling process.

The United States Army Corps of Engineers, pursuant to the Rivers and Harbors Act, maintains jurisdiction over all navigable waterways (including non-navigable streams, creeks, marshes, and diked lands) and requires a permit for any work within these waterways.

AGENCIES WITH REVIEW AUTHORITY

While the following agencies do not issue permits, they do maintain review authority and may comment on aspects of a development proposal that are related to their particular areas of expertise.

The State Department of Boating and Waterways comments on river-orientated features of a riverfront project such as potential navigation hazards, relation to existing or planned boating facilities and the public trust doctrine. This department also administers grants and loans for marina development and boat ramps and reviews federal and local ordinances regulating boating activities.

The State Department of Water Resources (DWR) built and operates the State Water Project which delivers half of the water supply as far south as Riverside County. Under the auspices of the Federal Energy and Power Commission, the DWR participates in the operational decisions affecting State Water Project facilities pertaining to power generation. The DWR also coordinates CEQA and NEPA comments for many departments of the State Resources Agency. The DWR sets state water well standards. Some of the DWR's original duties have been turned over to the State Department of Fish and Game and the State Department of Parks and Recreation. These agencies cooperate with DWR as subcontractors for specialized services, in the provision of fish, wildlife, and habitat management, and recreational operations and enhancement.

The State Department of Parks and Recreation reviews development projects in relation to state recreational facilities and grants for local facilities. Within the Department of Parks and Recreation, the State Office of Historic Preservation is the designated State Historic Preservation Office (SHPO) and monitors State- and Federally-registered historic resources, as well as carrying out other statutory responsibilities.

The California Native American Heritage Commission reviews projects and comments on potential impacts to Native American archaeological resources. The Commission is directly involved with a procedure if Native American artifacts or remains are discovered during construction activities.

The State Department of Fish and Game (DFG), as a trustee agency, reviews projects and comments on potential impacts to fish and wildlife resources in general, and identifies potential impacts to endangered or threatened plant or animal species under the California Endangered Species Act. The Department is required to issue a written finding whether a proposed project would "jeopardize" the continued existence of any species, or result in the destruction or adverse modification of habitat essential to the continued existence of the species. If the Department makes this "jeopardy" finding, it is then required to develop "reasonable and prudent alternatives" to conserve the endangered or threatened species.

The California State Clearinghouse, within the Office of Permit Assistance, is the point of contact for review of environmental documents where one or more state agencies will be a responsible or trustee agency. The Clearinghouse circulates environmental documents among state agencies, coordinates review and forwards comments to the lead agency.

The State Mining and Geology Board reviews petitions (by an individual or organization) to classify specific lands that contain significant mineral deposits and that are threatened by land use incompatibilities. Mineral lands classified as having regional or statewide significance, in accordance with California's Surface Mining and Reclamation Act (SMARA), ultimately must be recognized in the County general plan through adoption of an appropriate and compatible land use designation and through establishment of policies and implementation programs for conservation and development of these resources.

The United States Environmental Protection Agency (EPA) has review authority over environmental documents that are prepared and circulated pursuant to the National Environmental Protection Act (NEPA). The EPA can comment on draft environmental impact statements (EISs), and NEPA procedures require filing of final EISs with the EPA. The EPA has authority over development projects pursuant to Section 404 of the Clean Water Act, an authority that overlaps with that of the Army Corps of Engineers. Generally, the EPA reviews Department of Army permits for compliance with guidelines for implementing Section 404 requirements. The EPA can, in rare cases, override an Army Corps of Engineers decision on a Department of Army permit in order to prohibit discharges into waterways.

The United States Fish and Wildlife Service (USFWS) must be consulted on all federal projects, such as Army Corps of Engineers/Department of Army permits, pursuant to the Fish and Wildlife Coordination Act. The Service comments on potential project effects on "endangered or threatened" plant and animal species under the Federal Endangered Species Act. In reviewing a project, the Fish and Wildlife Service could issue a "jeopardy" determination and would propose alternatives to the permitting agency, in a manner similar to the State Department of Fish and Game process. The Fish and Wildlife Service also comments on potential effects on fish and wildlife resources.

The **National Marine Fisheries Service** is also consulted on all Department of Army Permits as part of the Fish and Wildlife Coordination Act. The National Marine Fisheries Service reviews development projects in relation to overall effects on anadromous fish such as salmon, striped bass, and steelhead. The Service also considers any endangered or threatened anadromous fish which may exist in the area.

AGENCIES THAT OWN LAND

Only 4.6 percent of lands within Sutter County are owned by public agencies. Table 2.9-1 below summarizes land ownership between various levels of government.

TABLE 2.9-1
GOVERNMENTAL OWNERSHIP OF LAND*

	FEDERAL	STATE	COUNTY	OTHER LOCAL AGENCIES	TOTAL
Acres	3,145	7,460	4,657	2,777	18,039
Percent of County Total Area	0.81%	1.92%	1.20%	0.71%	4.64%

* Table reflects parcels of over 1 acre in size. Parcels of less than one acre may not be included.

The **United States Fish and Wildlife Service (USFWS)** is the primary federal land owner in Sutter County. The Fish and Wildlife Service manages the Sutter National Wildlife Refuge containing approximately 2,467 acres and another 678 acres in the Butte Sink. The FWS has been acquiring land and easements in the Butte Sink area over the last several years in order to benefit waterfowl habitat.

The **State of California** (various agencies) is a landowner of many properties in Sutter County. State-owned lands are primarily under the control of the Department of Fish and Game (DFG) and the Department of Water Resources. Most of the DFG land is in the Feather River Management Area. Smaller holdings include those in the Butte Sink area and a portion of Gray Lodge Waterfowl Management Area north of the Sutter Buttes.

2.10 FINDINGS

- Sutter County can be divided into two major geographic units: valley and mountains (Sutter Buttes). With the exception of the Sutter Buttes, the County is located in the north central Sacramento River Valley.
- The Sutter Buttes represent an unique physical landscape that provides aesthetic value for the County.
- Other adopted County and regional plans include the SACOG Regional Transportation Plan, the Air Pollution Control FRAQMD Non-Attainment Plan, the Airport Comprehensive Land Use Plan; and the components of the Integrated Waste Management Plan.
- The Sutter County Zoning Ordinance provides for a total of 28 zoning districts. Major zoning categories are Agricultural, Residential, Commercial, and Industrial. The majority of the County is zoned for agricultural uses.
- The General Plans of the two incorporated cities (Yuba City and Live Oak) generally support preservation of agricultural land and measures (e.g. planned unit development, "infill" development) to prevent urban sprawl.
- Yuba City updated it's General Plan in 1989 and the City of Live Oak updated its plan in 1994.
- The Sutter County Local Agency Formation Commission (LAFCO) last amended the Sphere of Influence (SOI) for Yuba City in 1990. The Live Oak SOI has not been amended since its original adoption in 1984. LAFCO has approved a number of annexations to each of the cities during and since that time.
- Public facility and service constraints limit urban development in several areas of the County. These constraints include septic tank limitations, water quality concerns and storm drainage problems.
- The amount of State and Federally owned land in Sutter County is not significant; however, at times these agencies exercise some form of permitting or review authority over land use decisions in the County.
- The random location of new residential development has the potential to create land use conflicts and, in most instances, make the provision of services more difficult.
- Land within the Yuba City and Live Oak spheres of influence appears to be sufficient to meet the needs of each community based on growth projections for the next 20 years.
- Sutter County does not have the facilities or resources to provide full urban services for new urban residential development.

- Lands within the spheres of influence of Yuba City and Live Oak will ultimately be annexed to those jurisdictions at some point in the future. Therefore, land use planning within the spheres should be conducted by each respective city in cooperation with the County.
- The designation of areas for commercial and industrial development in a variety of locations is necessary in order to provide adequate opportunities for new non-residential development.
- In order to create an atmosphere where industrial development can thrive, industrial areas must be protected from encroachment by potentially incompatible uses.
- Buffers can be utilized in conjunction with other strategies to reduce land use conflicts and protect the integrity of the County's industrially designated areas.
- Urbanization and other land conversion often results in conflicts between agricultural and non-agricultural land uses.
- Although a large portion of Sutter County is dedicated to agricultural production, the County also contains biological resources and wildlife habitat.
- The visual quality of the natural and built environment contributes to the overall perception of a community.
- Various inconsistencies exist in the unincorporated county between zoning and general plan land use designations that will require resolution within a reasonable period of time following adoption of the general plan.

CHAPTER 3

ECONOMIC

3.1 INTRODUCTION

This chapter presents an overview of the economic conditions of and within Sutter County.

3.2 EMPLOYMENT

Employment in Sutter County, from its earliest beginnings, has been dominated by agriculture and agriculturally related services and industries. It has been demonstrated in the Population Chapter that the historical concentration of residents has been in the rural and unincorporated areas of the County. Current figures show the majority of the County's population now resides in the urban area yet agriculture continues to contribute to the economic vitality of the County. This is demonstrated by Table 3.2-1 which lists the largest employers in the County as of June, 1993. Of the 23 firms listed, seven are agricultural processors or agricultural service firms. These firms once employed between 703 and 2,268 people; however, since Table 3.2-1 was produced, the Harter Pik'd Rite cannery has closed and the Harter Tomato Products Company has opened. There was a net loss of 23 to 1,100 jobs due to the events mentioned above. Retail department and hardware stores make up 6 of the 23 firms listed, and employ 730 people, an indication of Sutter County's retail and service sector employment.

Table 3.2-2 contains employment data from the Census industry group from 1940 through 1970. The table shows that agricultural employment reached it's peak in the 1940's and 50's, and then gradually decreased in the 60's and 70's. The decrease can be greatly attributed to changes in farming operations (principally the mechanization of farming operations). Table 3.2-3, which contains employment data from the Census industry group from 1980 and 1990, shows an increase in agricultural employment in contrast to the 1960's and 70's; however, it is difficult to calculate what portion of this increase can be attributed to agricultural employment since the 1980 and 1990 Census' added Fisheries and Mining to the Agriculture Services category.

Table 3.2-3 also shows that the greatest increase of all industry groups was in the "Other Professional & Related Services" industry group. The 111 percent increase appears to be related to commuter increases to Sacramento rather than actual employment growth in Sutter County. In contrast, the "Communications & Other Public Utilities" industry group shows the greatest decrease of all groups. This 28.48 percent decrease is primarily attributed to the closure of the local Pacific Bell office that occurred as part of the breakup and restructuring of American Telephone and Telegraph (AT&T).

It is important to note that information in Tables 3.2-2 and 3.2-3 are based on place of residence, and therefore, these figures depict industry groups in which Sutter County residents work in, whether it's inside or outside of Sutter County.

TABLE 3.2-1

MAJOR SUTTER COUNTY EMPLOYERS

EMPLOYER	TYPE OF BUSINESS	# OF EMPLOYEES
Fremont-Rideout Health Group	Health Care Service	1500
Harter Pik'd Rite	Fruit Processing	40-1200 (Seasonal)
Yuba City Unified School Dist.	Education	840
County of Sutter	Government	700
Sunsweet Growers, Inc.	Fruit Processing	433
Siller Brothers, Inc.	Timber	100-350 (Seasonal)
Wal-Mart	Retail Dept. Store	275
Sunset Molding	Wood Molding	214
City of Yuba City	Government	207
Danna & Danna, Inc.	Melon Growing	25-200 (Seasonal)
Live Oak Unified School Dist.	Educational	180
Avalon Bay Foods, Inc.	Seafood Processor	165
Target	Retail Dept. Store	150
Valleyview Packing Co., Inc.	Fruit Processing	35-150 (Seasonal)
California Prune Packing	Fruit Processing	125
K-Mart	Retail Dept. Store	120
Sears Roebuck and Co.	Retail Dept. Store	110
Sun Ridge Hosp. & Counseling	Health Care Service	100
J.C. Penney Co., Inc.	Retail Dept. Store	80
Wild Rice Exchange	Rice Processor	40-80 (Seasonal)
Sunsweet Dryers, Inc. #54	Fruit Dehydrating	5-80 (Seasonal)
Orchard Supply Hardware	Retail Hardware	75
Yuba City Steel Products Co.	Metal Fabrication	75

Source: University Center For Economic Development and Planning, CSUC.

TABLE 3.2-2
EMPLOYMENT BY INDUSTRY GROUP
1940, 1950, 1960 & 1970

	1940	1950	1960	1970
Resources:				
Agriculture & Ag Services	2,890	3,498	3,073	2,721
Forestry & Fisheries	3	4	12	22
Mining	67	41	51	15
Sub-Total	2,960	3,543	3,136	2,758
Manufacturing:				
Food & Kindred Products	125	225	446	402
Lumber & Wood Products	9	103	195	276
Others	86	188	92	405
Sub-Total	220	516	733	1,083
Wholesale & Retail Trade:				
Wholesale Trade	160	262	308	417
Food Stores	145	280	288	380
Eating & Drinking Places	81	244	288	446
Other Retail Trade	345	736	1,204	1,746
Sub-Total	731	1,522	2,088	2,989
Services:				
Lodging & Personal Services	136	238	232	349
Entertainment & Recreation	35	60	63	101
Profession Services	336	659	1,248	2,597
Other Services	294	440	580	644
Sub-Total	801	1,397	2,123	3,691
Government:				
Public Administration	167	306	548	886
Federal Military	0	12	210	520
Sub-Total	167	318	758	1,406
Other:				
Construction	395	768	1,313	1,247
Transportation, Comm. & Public Utilities	374	690	790	1,113
Finance, Insurance & Real Estate	81	200	325	595
Industry Not Reported	114	144	235	913
Sub-Total	964	1,802	2,663	3,868
County Total	5,843	9,098	11,501	15,795

Source: U.S. Census

TABLE 3.2-3
1980 AND 1990 EMPLOYMENT BY INDUSTRY

INDUSTRY	NO. OF JOBS		PERCENTAGE CHANGE
	1980	1990	
Agriculture, Forestry, Fisheries & Mining	3,232	3,321	2.75%
Construction	1,378	2,058	49.35%
Manufacturing, Nondurable Goods	834	1,046	25.42%
Manufacturing, Durable Goods	1,023	1,481	44.77%
Transportation	696	1,204	72.99%
Communications & Other Public Utilities	804	575	-28.48%
Wholesale Trade	677	918	35.60%
Retail Trade	3,517	4,804	36.59%
Finance, Insurance & Real Estate	1,125	1,401	24.53%
Business & Repair Services	721	1,061	47.16%
Personal & Entertainment Services	724	940	29.83%
Health Services	1,377	2,082	51.20%
Educational Services	1,830	2,355	28.69%
Other Professional & Related Services	809	1,708	111.12%
Public Administration	1,422	1,405	-1.20%
Total	22,149	28,349	30.67%

Table 3.2-4 depicts employment projections based on place of work. Therefore, these figures represent projected jobs within Sutter County. Although this particular table does not have employment projections for the agriculture sector, according to the U.S. Census Bureau, farming, forestry, and fishing occupations slipped from 14% of all employment in 1980 to 11% in 1990. Retail trade currently predominates with 30% of the total employment in 1995. This is a reflection of Sutter County jobs being primarily service orientated.

TABLE 3.2-4**EMPLOYMENT PROJECTIONS**

INDUSTRY	1994	1995	2000	2005	2010	2015	2020
Retail	6,067	6,350	7,769	8,858	9,884	10,834	11,970
Office	2,932	3,084	4,153	5,372	6,621	8,047	9,284
Medical	1,137	1,165	1,267	1,529	1,802	2,052	2,259
Educational	1,535	1,535	1,537	1,576	1,642	1,648	1,653
Manufacturing	1,862	1,892	2,462	3,222	4,031	4,885	5,679
Other	7,222	7,467	8,012	8,572	9,210	9,834	10,651
Total	20,755	21,493	25,200	29,129	33,190	37,300	41,496

Source: SACOG 1995 Regional Housing, Population & Employment Projections: Documentation & Analysis, February 1996

Table 3.2-5 contains employment data on Sutter County by occupation between 1980 and 1990. This data is also based on place of residence, but differs in information from Table 3.2-3 in that occupation groups differ from industry groups. For example, a person working as a receptionist in a real estate office may be categorized as working in the "Finance, Insurance and Real Estate" industry, however, their occupation would be categorized as "Administrative Support, Including Clerical".

The "Professional Specialty" and "Executive, Administrative and Managerial" occupation groups showed the greatest increase of all occupation groups between 1980 and 1990. The respective 61.97 and 42.07 percent increases is most likely attributed to Sutter County residents commuting to the Sacramento area for these types of occupations. A substantial increase occurred under the Transportation classification that may be attributed to the closure of the Del Monte Cannery during the early 1980's. A consequence of the cannery closure required increased transport of local agricultural products and thus the increase in transportation jobs. The Community Services Department processed numerous permits for agricultural truck terminals in the years following the cannery closure, showing an increase in local agricultural hauling.

TABLE 3.2-5**1980 AND 1990 EMPLOYMENT BY OCCUPATION**

OCCUPATION	NO. OF JOBS		PERCENTAGE CHANGE
	1980	1990	
Executive, Administrative & Managerial	1,968	2,796	42.07%
Professional Specialty	2,230	3,612	61.97%
Technicians & Related Support	560	732	30.71%
Sale	2,210	3,027	36.97%
Administrative Support, Including Clerical	3,045	4,079	33.96%
Private Household Services	95	119	25.26%
Protective Services	301	368	22.26%
Services except Protective and Household	2,083	2,456	17.91%
Farming, Forestry and Fishing Occupations	2,793	2,788	0.18%
Precision Production, Crafts & Repair Occupations	2,582	3,291	27.46%
Machine Operators, Assemblers & Inspectors	786	980	24.68%
Transportation & Material Moving Occupations	854	1,147	34.31%
Handlers, Equipment Cleaners, Helpers & Laborers	662	964	45.62%
Total	20,169	26,359	30.69

Source: U.S. Census

Tables 3.2-6 and 3.2-8 contain data on place of employment for Sutter County residents. Table 3.2-7 contains the same data for Yuba County residents. These tables demonstrate the increasing proportion of the population commuting to locations outside Sutter County for employment. According to Table 3.2-6, the percentage of Sutter County residents working outside of the County increased from 33.5 percent in 1980 to 40.4 percent in 1990. A similar trend can be found in Table 3.2-7 for Yuba County residents.

TABLE 3.2-6

PLACE OF WORK - SUTTER COUNTY RESIDENTS
(Persons 16 years of Age or Older)

	1980		1990	
Total Workers Reporting	18,536	100.0%	26,137	100.0%
Sutter County	12,275	66.2%	15,574	59.6%
Outside of Sutter County	6,210	33.5%	10,563	40.4%
Outside of State	51	0.3%	77	0.3%
In Yuba City MSA	16,466	88.8%	21,637	82.8%
In Yuba City	7,593	41.0%	10,108	38.7%
Remainder of Sutter County	4,682	25.3%	5,466	20.9%
Yuba County	4,191	22.6%	6,063	23.2%
Not in Yuba City MSA, but in California	2,019	10.9%	4,423	16.9%
Central City of Other MSA	597	3.2%	2,035	7.8%
Remainder of Other MSA	935	5.0%	1,971	7.5%
No MSA	487	2.6%	417	1.6%

Source: U.S. Census

TABLE 3.2-7

PLACE OF WORK - YUBA COUNTY RESIDENTS
(Persons 16 years of Age or Older)

	1980		1990	
Total Workers Reporting	15,806	100.0%	20,689	100.0%
Yuba County	11,592	73.3%	12,926	62.5%
Outside of Yuba County	4,214	26.7%	7,763	37.5%
Outside of State	137	0.9%	107	0.5%
In Yuba City MSA	14,381	90.9%	17,253	83.4%
In Yuba City	2,153	13.6%	3,383	16.4%
Remainder of Sutter County	636	4.0%	944	4.6%
Yuba County	11,592	73.3%	12,926	62.5%
Not in Yuba City MSA, but in California	1,288	8.1%	3,329	16.1%
Central City of Other MSA	235	1.5%	1,317	6.4%
Remainder of Other MSA	944	6.0%	1,638	7.9%
No MSA	109	0.7%	374	1.8%

Source: U.S. Census

TABLE 3.2-8

YUBA CITY MSA - PLACE OF WORK
BY COUNTY OF EMPLOYMENT

	1980	1990
Employed in Sutter County:		
Resides in Sutter County	12,275	15,574
Resides in Yuba County	2,789	4,327
County Sub-Total	15,064	19,901
Employed in Yuba County:		
Resides in Sutter County	4,191	6,063
Resides in Yuba County	11,592	12,926
County Sub-Total	15,783	18,989
Total MSA	30,847	38,890

Source: U.S. Census

Sutter County has historically had a high level of unemployment, characteristically common among agricultural communities. Table 3.2-9 summarizes the size of the labor force, employment and unemployment rate for the County from 1983 to 1995. During this entire period, Sutter County's unemployment rate ranged between the second and fourth highest among all California counties.

TABLE 3.2-9

SUTTER COUNTY LABOR FORCE

	Civilian Labor Force	Employment	Unemployment Rate
1983	24,625	19,175	22.2%
1984	24,325	19,575	19.6%
1985	26,275	22,000	16.3%
1986	25,800	22,050	14.6%
1987	26,375	23,300	11.7%
1988	27,825	24,400	12.3%
1989	29,325	25,525	13.0%
1990	33,600	29,375	12.6%
1991	34,775	29,375	15.5%
1992	34,250	28,000	18.3%
1993	34,770	28,710	17.4%
1994	34,300	28,800	16.0%
1995	34,525	28,825	16.5%

Source: "Annual Planning Information, Yuba City, 1994", Employment Development Department (EDD) and personal discussion with EDD

3.3 INDUSTRY AND LABOR FORCE FORECAST

The State of California Employment Development Department (EDD) prepares projections for employment by geographic area within the State. Table 3.3-1 contains employment wage and salary projections for the Yuba City Metropolitan Statistical Area between 1990 and 1997. This table, as well as the following text, has been extracted from EDD's "Annual Planning Information" series. This material was prepared for the bi-counties area to provide a more accurate picture of the local economy. Employment is reported by place of work.

Note: The highlighted forecast numbers may be overstated. Since the forecast was made, a major fruit canning facility employing approximately 1,100 people, had closed. Please take caution when using industry employment numbers highlighted in bold print on the following table and its interpretation on the following narrative.

TABLE 3.3-1

**YUBA CITY MSA
1997 WAGE AND SALARY FORECAST**

INDUSTRY	HISTORICAL	FORECAST	ABSOLUTE CHANGE
	1990	1997	1990 - 1997
Total, All Industries	37,850	42,700	4,850
Total Agriculture, Forestry & Fishing	6,350	6,675	325
Agriculture Production	5,050	5,225	175
Services, Forestry & Fishing	1,300	1,450	150
Total Non-Agriculture	31,500	36,025	4,525
Construction & Mining	2,025	2,175	150
Manufacturing	3,375	4,125	750
Food & Kindred Products	1,175	1,775	600
Lumber & Wood Products	1,450	1,400	-50
Other Manufacturing	750	950	200
Transportation & Public Utilities	1,400	1,425	25
Wholesale Trade	1,500	1,775	275
Retail Trade	6,775	7,800	1,025
Finance, Insurance & Real Estate	1,425	1,625	200
Services	6,200	7,075	875
Government	8,825	10,025	1,200
Federal	1,600	1,600	0
State	950	1,100	150
Local & Education	6,275	7,350	1,075

Source: "Annual Planning Information, Yuba City, 1994", Employment Development Department

Employment in the Yuba City Metropolitan Statistical Area (MSA) is expected to expand by 12.8 percent from 1990 to 1997. However, growth will occur at a slightly slower pace early in the projection period, as a result of sluggish economic conditions. Then it picks up momentum towards the end of the period. Overall, the wage and salary employment levels are projected to rise moderately in all industry divisions, led by growth in government, retail trade, services, and manufacturing industry divisions.

Employment in agriculture, the third largest industry division, is expected to edge upward by 5.1 percent during the outlook period. However, possible future drought conditions could possibly affect the industry division, slowing expected expansion of agricultural payrolls.

Employment in the mining and construction division is projected to grow by about 150 jobs between 1990 and 1997. The mining component is expected to expand (in Yuba County) in the gold ore and construction sand and gravel industries; the latter plays a crucial role in the construction division. Most future growth in the construction component will be centered in general building and special trade contractors. These industries perform activities associated with residential construction and gains are generally attributed to area population growth. As families continue to relocate to the Yuba City MSA to find lower living and housing costs, area construction should continue to expand at a steady rate.

Employment in the manufacturing division is expected to grow by 750 jobs over the projected period, an overall growth rate of 22.2 percent. This exceeds the total area industry increase of 12.8 percent and makes manufacturing the fastest growing among all the area's divisions. Most new jobs in manufacturing will be focused in the food processing industry, continuing the area's strong history of producing and processing agricultural products. Also, slight losses are forecast (in Yuba County) in the lumber and wood products industry. This reflects an overall trend in Northern California, caused primarily by increased environmental controls by both public and private concerns.

The transportation and public utilities industry division is expected to grow slightly during the projected period. Growth will be concentrated equally in both the local and inter-urban transportation, trucking and warehousing industries. The utilities and sanitary services industry is projected to show the largest loss within the division, dropping 75 jobs during the seven year period.

The wholesale trade division is expected to grow slightly during the forecast period. Growth will be concentrated equally in local and inter-urban transportation, and trucking and warehousing.

Retail trade is expected to expand by 1,025 jobs, a healthy growth rate of 15.1 percent between 1990 and 1997. This growth is supported by equal employment increases in eating and drinking places, and miscellaneous retail stores, which include lumber and building materials, drug, clothing, sporting goods, and electronic goods stores. These advancements in employment are mainly a result of increased demand for retail goods caused by expansion of the area population.

The finance, insurance, and real estate division is expected to expand by 200 jobs over the forecast period. Most new job growth will be concentrated in establishments providing health insurance, banking services, and real estate services. Job increases in this industry division are directly related to population growth in the area.

During the projected period, the services division is expected to experience substantial job gains. Within the Yuba City MSA, health services will gain the most jobs, increasing by 425. This increase is not only a response to the demand for services by a rising population, but also the anticipated expansion of existing medical facilities and an upgrading of the medical services offered in this area. Moderate gains are also expected for the remaining service industries, especially those which provide business, personnel, lodging and repair services.

Government, the largest division in terms of employment, is expected to increase by 1,200 jobs between 1990 and 1997. This represents the largest absolute job gain among the area's industry divisions. The local government component will generate most of the new jobs, primarily in education, while state government will experience moderate growth and the federal component will remain stable.

3.4 RETAIL SALES

The local portion of the sales tax, one-and-one-quarter percent of taxable sales (this was changed from one percent in 1991), is distributed to the local jurisdictions based upon the location of the transaction that generates the tax. If the transaction occurs within a city, then the city receives one percent of the sales tax while one-quarter percent is given to the County. If the transaction occurs within the unincorporated area of the County, then the County receives the entire one-and-one-quarter percent sales tax revenue. The extra one-quarter percent sales tax revenue received by the County is earmarked for police and fire protection and is, therefore, not reflected in Tables 3.4-1 and 3.4-2.

Table 3.4-1 contains a summary of taxable sales totals by Sutter County jurisdictions from 1970 to 1994. Table 3.4-2 is a summary of per capita retail sales tax revenue by jurisdiction for selected years between 1970 to 1994. Table 3.4-1 shows the effect on the local economy of the 1982 and 1991 recessionary periods. Each of the three Sutter County jurisdictions (Yuba City, Live Oak and Sutter County) were affected slightly differently by the recessions. Retail sales in Yuba City decreased by only 1.21 percent during the 1982 recession and had recovered completely by the next year; however, Live Oak and unincorporated Sutter County retail sales decreased by 6.9 and 16.7 percent respectively, and had more difficulty in recovering. Although retail sales increased in absolute dollars in Yuba City between 1990 and 1992, when taking inflation into account, there was a real dollar drop.

TABLE 3.4-1

TAXABLE SALES
(\$1,000)

YEAR	SUTTER COUNTY TOTAL	YUBA CITY	LIVE OAK	UNINCORPORATED AREA
1970	79,671	45,609	2,066	31,996
1971	92,087	53,052	2,391	36,644
1972	104,559	59,135	2,597	42,827
1973	121,728	69,624	3,010	49,094
1974	147,100	79,891	3,312	63,897
1975	171,447	94,019	3,698	73,730
1976	179,731	107,816	4,095	67,820
1977	204,654	125,360	4,565	74,729
1978	239,941	143,246	5,180	91,515
1979	280,553	171,856	7,346	101,351
1980	289,829	176,971	6,686	106,172
1981	304,991	184,249	7,303	113,439
1982	286,048	182,045	6,829	97,174
1983	295,927	192,839	6,883	96,205
1984	331,522	211,173	6,870	113,479
1985	338,000	222,781	7,174	108,045
1986	373,746	250,701	6,933	116,112
1987	396,052	259,687	7,533	128,832
1988	436,047	284,764	7,276	144,007
1989	477,242	317,302	8,250	151,690
1990	556,440	372,375	10,012	174,053
1991	541,013	374,037	11,357	155,619
1992	542,357	380,992	11,071	150,294
1993	579,524	407,457	10,511	161,556
1994	620,380	436,224	9,954	174,202

Source: Department of Finance

The Sutter County unincorporated area and City of Live Oak showed a much more severe reaction to the economic slow down of the early 1980's and 1990's. The combination of the recession and the agricultural price decline that occurred during the 1980's resulted in less than normal retail sales.

Table 3.4-2 also shows the affects of the two recessionary periods mentioned above. None of the four areas described in Table 3.4-2 has recovered to pre-1991 per capita retail sales figures, however, steady increases have been made for all areas except the City of Live Oak.

TABLE 3.4-2
PER CAPITA RETAIL SALES

YEAR	SUTTER COUNTY TOTAL	YUBA CITY	LIVE OAK	UNINCORPORATED AREA
1970	\$19.00	\$32.61	\$7.81	\$12.64
1975	\$37.27	\$62.02	\$13.85	\$26.17
1980	\$55.47	\$94.46	\$21.55	\$34.92
1985	\$58.71	\$105.60	\$19.41	\$32.96
1990	\$86.38	\$135.72	\$23.18	\$53.30
1992	\$78.97	\$126.43	\$23.41	\$44.44
1993	\$81.45	\$129.44	\$21.78	\$46.36
1994	\$84.82	\$129.85	\$19.54	\$45.03

Source: Sutter County Community Services Department

Another issue involving sales tax revenue is the fiscal impact the loss of those revenues has on the County upon annexation. Prior to 1990, the County and City of Yuba City had a master property tax agreement which they used to determine the distribution of property taxes upon annexation to Yuba City. This agreement, which had been in place since late 1983, allowed the annexation of property with no further discussions of revenue exchanges between the two agencies. In late 1989, the County cancelled the agreement because of the concerns over the mounting loss of sales tax with the annexation of commercial properties to Yuba City. Table 3.4-3 lists estimated sales tax revenue lost each year from January 1, 1984 to December 30, 1994. The most dramatic loss occurred in 1989 when Yuba City annexed approximately 66 acres of commercial and industrial land, which included an auto dealership, large furniture store, and other miscellaneous businesses. During the period between 1984 and 1994, the County lost approximately 11.9 percent of its sales tax revenue to the City of Yuba City.

TABLE 3.4-3

**COUNTY ESTIMATED RETAIL SALES
TAX SALE LOST TO YUBA CITY
(1984 to 1993)**

1984	\$0
1985	\$1,521
1986	\$6,757
1987	\$37,723
1988	\$8,000
1989	\$128,292
1990	\$3,750
1991	\$0
1992	\$1,500
1993	\$500
1994	\$1,000
Total	\$189,043

Source: Sutter County Community Services Department

3.5 PROPERTY TAX

Prior to the passage of Proposition 13 (Prop 13) in 1978, local agencies with taxing authority individually adopted specific tax rates for their own jurisdictions. The annual tax rate (along with the annual property assessment) allowed each agency to control the primary source of its discretionary revenue and thus, substantially control its own budget from the standpoint of meeting community needs.

The passage of Prop 13 and implementing measure Assembly Bill 8 reduced local agency property tax revenue to approximately 25 percent of the historical levels. Prop 13 limited general property taxes to one percent of the assessed value of properties. Assembly Bill 8 limited property tax sharing ratios (sometimes called Tax Apportionment Factors) to pre-Prop 13 property tax rates for each agency. Sutter County normally received 31 percent of local property taxes with the remainder going to cities, school districts and other special districts.

Subsequent to Prop 13, the State provided additional funding to the local agencies to support mandated programs. During the 1980's this additional funding (subvention funding) as well as mandatory reimbursement levels to local agencies steadily declined. The economic recession of the

early 1990's led to the elimination of subvention funding and reductions in the percentage of local property taxes returned to the County. These changes have resulted in the County's portion of local property taxes being reduced from 31 percent to 17 percent. This translated into a 3.9 million dollar loss for Sutter County in fiscal year 1993-1994. A one half cent sales tax increase was made permanent by a statewide ballot measure that is estimated to provide approximately \$751,000 of additional revenue to the County based on 1992 retail sales figures.

While cities, as well as counties, lost a significant portion of their property tax revenues and their ability to directly set tax rates, cities are able to indirectly affect property tax revenues more effectively than counties can. Since the passage of Prop 13 there has been a substantial increase in new incorporation and annexations in California. At the time of a new incorporation or an annexation, part of the county's share of property tax revenues are transferred to the city. In the case of a new incorporation the amount of property tax transfer is determined by provisions of law. In the case of an annexation, the amount of transfer is subject to negotiation between the county and city.

Cities also have another distinct advantage over counties with the use of redevelopment project areas. When an area is declared a redevelopment project area, the property tax base is "frozen" for the life of the redevelopment project, often as long as 30 years. The redevelopment fund then collects the difference between the property tax on the "frozen base" and the property tax on the current assessed value (referred to as the "tax increment"). In the early years of a redevelopment project this is a relatively small sum. Over time, as improvements are made and properties change hands, the property tax increment can be quite substantial. When the base is frozen, the county is deprived of increased revenues from the property tax increment. The redevelopment agency is required by State law to use 20 percent of these revenues for low and moderate income housing. Although increased commercial and industrial development within a city has a relatively small impact on many county services, residential development within a city, particularly low and moderate income housing, can significantly increase demand for county services.

3.6 FINDINGS

- The agricultural industry continues to provide a substantial portion of the economic base for Sutter County.
- Sutter County is increasingly becoming a bedroom community for commuters who are employed outside the County in a variety of professional and related occupations.
- The retail sector in Sutter County currently predominates with 30% of the total 1995 employment.
- Sutter County exhibits the characteristically high unemployment rate found in most rural agricultural jurisdictions.

- Most of the job growth in Sutter County over the past decade has been associated with increases in population. This trend is expected to continue, with services, retail, local government and education employment growing at the fastest rate because of population increases. Manufacturing, wholesale, and agriculture are expected to provide moderate growth.

3.7 PERSONS CONSULTED

Cervantes, Debbie. Labor Market Information Division, Employment Development Department

Dominguez, Laura. Harter Tomato Products, Company

3.8 BIBLIOGRAPHY

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CHAPTER 4

TRANSPORTATION AND CIRCULATION

4.1 INTRODUCTION

This chapter describes the existing transportation system within Sutter County. It provides details on the various modes of transportation available for different uses. This chapter also includes information on projected transportation deficiencies and needs based on build out of the General Plan.

4.2 EXISTING CIRCULATION SYSTEM

Sutter County has approximately 1,061 miles of public roadways including the roadways within the incorporated cities. These roadways carry an estimated 630 million vehicle miles of travel demand annually. Table 4.2-1 shows road miles by jurisdiction in Sutter County and Figure 4.2-1 shows the roadway network system of the County.

TABLE 4.2- 1
ROADWAY MILES IN SUTTER COUNTY BY JURISDICTION

Jurisdiction	Miles
Sutter County	860
State of California	84
City of Yuba City	100
City of Live Oak	17
Total	1,061

The roadways in Sutter County lie predominantly in north-south and east-west directions. State Route 20 and State Route 99 are the primary regional transportation corridors within the County. State Route 20 serves east-west regional travel providing connection to Yuba County and beyond to the east and Colusa County and beyond to the west. State Route 99 serves as the north-south regional travel corridor providing connection to Butte County and beyond to the north and Sacramento County and beyond to the south. State Route 70 and State Route 113 are two other state highways that support north-south regional travel. This regional system of state highways is interconnected by a system of major (arterial/collector) and minor (local) county roads; the combination of regional and local roadway systems compliment each other to support the basic movement of goods and people.

BIKEWAYS

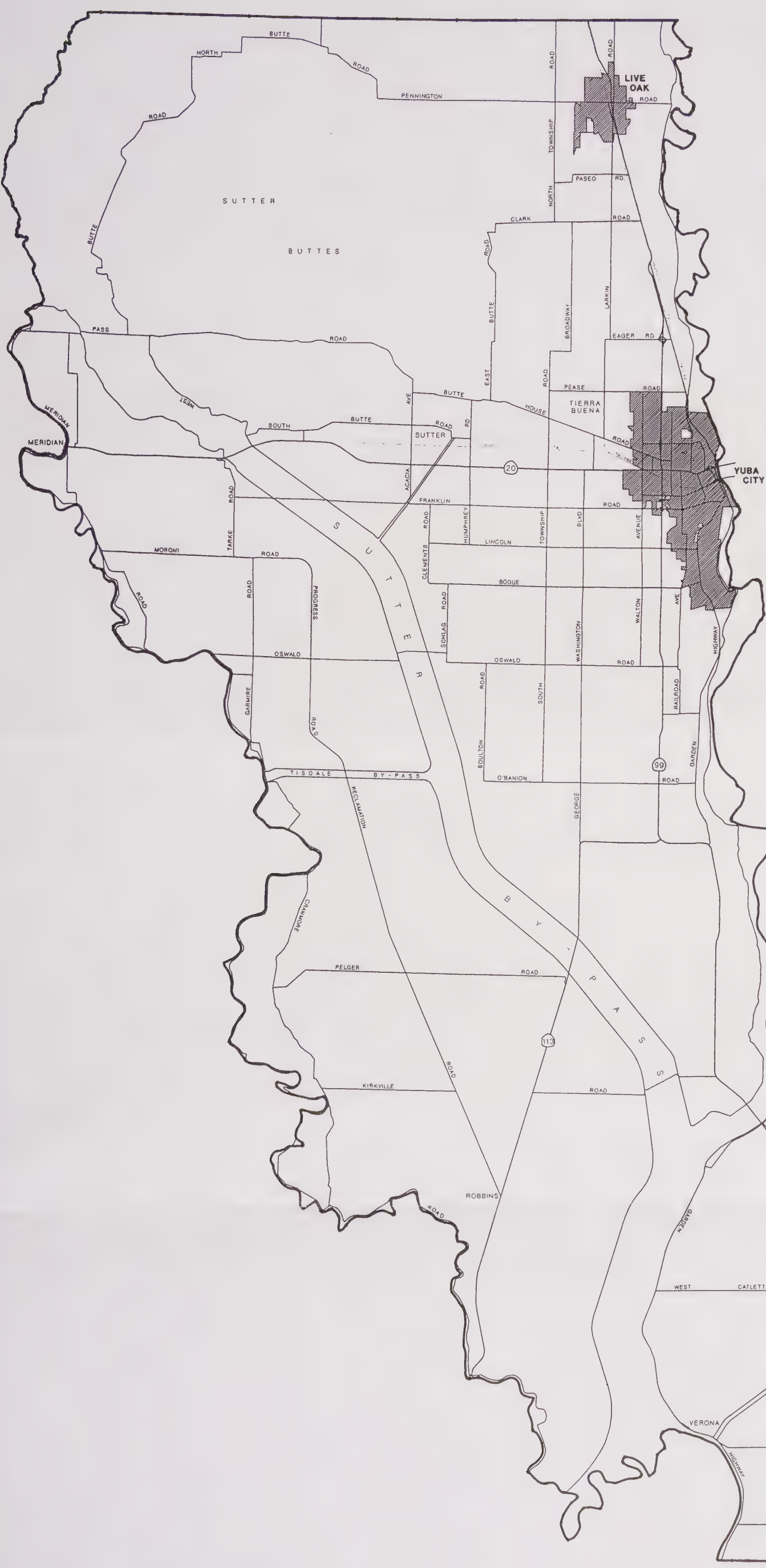
It is anticipated that in 1996 Sutter County will adopt the Yuba-Sutter Bikeway Master Plan. This Bikeway Plan was prepared for the Feather River Air Quality Management District and provides a comprehensive bikeway network for Sutter and Yuba Counties.

This bi-county plan includes:

- Bikeway goals and policies
- Identifies existing conditions
- Incorporates an analysis of demand
- Delineates existing and proposed bikeway routes
- Includes a cost and funding analysis
- Provides an implementation strategy

In its entirety, the proposed system includes approximately 395 miles (635 km) of bikeway facilities. As shown on Figure 4.2-2, proposed facilities specifically within Sutter County include 8.3 miles (13.4 km) of Class I bikeways, 29.6 miles (47.6 km) of Class II bikeways and 172.2 miles (277.1 km) of Class III bikeways. As described within the Plan, a Class I bikeway consists of a completely separated right-of-way for the exclusive use of bicycles and pedestrians with minimal crossflow traffic. A Class II bikeway provides a striped lane for one-way bike travel on a street or highway and a Class III bikeway utilizes bike route signs to identify routes which provide for shared use with pedestrian and motor vehicle traffic.

The proposed system not only connects each city in Yuba and Sutter Counties, but provides regional connections to six other counties, including Butte, Colusa, Nevada, Placer, Sacramento and Yolo. Connections to multi-modal facilities are also identified along with the need for support facilities and programs.



SUTTER COUNTY

ROADWAY NETWORK



prepared by the
SUTTER COUNTY COMMUNITY SERVICES DEPARTMENT



Figure 4.2-1
Roadway Network

SUTTER COUNTY

BIKEWAY MASTER PLAN

SEE FIGURE 4.5-4 OF THE E.I.R.
FOR BIKEWAY DETAIL IN THE
YUBA CITY URBAN AREA



0 10000 20000
SCALE IN FEET

prepared by the
SUTTER COUNTY COMMUNITY SERVICES DEPARTMENT

LEGEND

- Proposed Class I (bike path)
- Proposed Class II (bike lane)
- Proposed Class III (bike route)

Figure 4.2-2
Bikeway Master Plan

4.3 PHYSICAL CONSTRAINTS

Physical constraints to the County's circulation system include both natural and man-made barriers that limit roadway connections and alignments. The main natural barriers to travel are the three rivers (Sacramento River, Feather River and Bear River) that border Sutter County. The Sacramento River flows along the majority of both the Colusa County and Yolo County lines. The Feather River and Bear River flow along the Yuba County line from the north and east directions separately. Downstream of the Bear River confluence with the Feather River, the Feather River flows diagonally through the southern part of the County before entering the Sacramento River. The Sutter Bypass, bisecting the County from the Sutter Buttes in the northwest, to the Sacramento River in the south, and the railroad tracks through the communities of Yuba City, Tierra Buena and Live Oak are the major man-made barriers to travel in Sutter County. The combination of the above mentioned natural and man-made barriers dictate the travel opportunities within the County as well as the access to the surrounding region.

4.4 FUNCTIONAL CLASSIFICATION AND DESIGN STANDARDS OF ROADWAYS

Sutter County's streets and highways are organized in a hierarchy according to their functional classification. This functionally designed street system provides for a series of distinct stages which are involved in making a trip, that is, primary movement on highways and arterials, collection/distribution on collectors, and access and termination on local streets. In addition, the streets are also classified as rural and urban to recognize the areas and the type of traffic the streets serve. It is necessary to understand that the service provided by the rural and urban roadways are different in character. Often rural roadways serve dual functions, i.e. distribution as well as termination/access.

The following is a brief discussion on different types of roadways classified by the function they serve. The first two classifications serve both rural and urban areas by providing travel on important, usually high volume, corridors.

State Roadways

FREEWAYS AND EXPRESSWAYS

Freeways and expressways serve both inter-regional and intra-regional circulation needs. These facilities are typically accessed by collector or arterial roadways and have few or no at-grade crossings. These facilities have the highest carrying capacity with the maximum speed limits allowed by law.

REGIONAL HIGHWAYS

Regional Highways are classified as Rural Arterials and are used as primary connections between major traffic generators or as primary links to state and national highway networks. Such routes often have long sections through rural environments without traffic control interruptions. Speed limits often range between 35 and 55 mph.

URBAN ROADWAYS

Urban Arterials provide intra-city circulation and connections to regional roadways. They are fed by both local and collector streets. Even though the principal function of these roadways is movement, occasionally they provide access to adjacent properties, especially in commercial areas. The speed limits on arterials often range from 35 to 45 mph.

Urban Collectors accumulate traffic from local roadways and distribute that traffic to roadways that are higher in the hierarchy of classification. Collectors also provide access to adjacent properties. These roads carry light to moderate traffic volumes with travel speeds ranging between 25 and 35 mph.

Urban Local roads provide direct access to adjacent properties and are typically designed to discourage through-traffic. Urban local roads also provide access to collector roadways carrying very low traffic volumes at slow speeds, typically 25 mph.

RURAL ROADWAYS

Rural Arterials provide primary connections between rural areas and also distribute traffic between rural and urban areas. In addition, rural arterials provide considerable statewide and interstate circulation. Speed limits often range from 35 to 55 mph.

Rural Collectors typically serve intra-county rather than regional or statewide circulation needs. Their primary function is to provide access to adjacent properties and connections between rural local roads and other roadways that are higher in the hierarchy of classification. Travel speeds on rural collectors often range between 25 mph and 45 mph.

Rural Local roads provide access to adjacent properties and distribute traffic to rural collectors. They differ from their urban counterparts in design cross section and their location. Travel speeds on rural local streets typically range from 25 to 35 mph.

4.5 MAJOR ROADWAYS IN SUTTER COUNTY

Following is a brief description of important roadways that serve Sutter County.

FREEWAYS

State Route 99 between Highway 20 and to a point north of Eager Road is the only freeway segment in the County. The State Route 99 freeway segment starts from north of State Route 20 in Yuba City as a four lane facility with interchanges at Queens Avenue and Eager Road. Just south of Encinal Road, the freeway segment transitions to a two lane roadway.

REGIONAL HIGHWAYS

State Route 20 is a two, four and six lane roadway which extends through Sutter County from Colusa County to Yuba County.

State Route 70 is a two lane roadway which extends from the Yuba County line in the north, south to a junction with State Route 99. At the junction with State Route 99, State Route 70 continues south as State Route 70/99 to the Sacramento County line. The roadway provides regional access to the cities of Sacramento and Marysville.

State Route 99 extends from the Sacramento County line north through Sutter County to the Butte County line. The roadway has two and four lanes over its length and provides regional access to the Sacramento metropolitan area in the south and the cities of Gridley and Chico in the north and beyond.

State Route 113 within the County extends from the Yolo County line over the Sacramento River to State Route 99 near the community of Tudor. This two-lane roadway is only one of two roadways that cross the Sacramento River in Sutter County.

MAJOR URBAN AND RURAL ROADWAYS

The following are other major roadways under the County's jurisdiction which serve Sutter County.

Acacia Avenue is a two lane north/south roadway that extends from Pass Road in the north to Franklin Road in the south. This roadway provides access to State Route 20 for the community of Sutter.

Bear River Drive is an east/west two lane roadway extending from the Placer County line in the east to slightly beyond Swanson Road in the west.

Bogue Road is an east/west two lane roadway extending from Garden Highway in the east to Clements Road in the west. This roadway provides access to State Route 99.

Broadway is a north/south two lane roadway extending from Clark Road in the north to Nuestro Road in the south.

Butte House Road is an east/west two lane roadway that extends from Acacia Avenue in the west to Yuba City in the east and provides access between the communities of Yuba City, Tierra Buena and Sutter.

Cranmore Road is a north/south two lane roadway aligned along the Sacramento River from Tisdale Bypass in the north to State Route 113 in the south. This roadway provides regional access to the communities of Cranmore and Kirkville. Cranmore Road along with Garmire Road and Meridian Road is part of the roadway system that fronts the Sacramento River in Sutter County.

East Butte Road is a north/south two lane roadway extending from Clark Road in the north to Butte House Road in the south. This roadway is part of a circulation system that encircles the Sutter Buttes.

El Margarita Road is a north/south two lane roadway that extends from Jefferson Avenue in the north to Colusa Frontage Road in the south and continues from State Route 20 to Franklin Road.

Encinal Road is an east/west two lane roadway that extends from State Route 99 in the east to Broadway in the west.

Franklin Road is an east/west two lane roadway between Tarke Road and Garden Highway. This roadway is located to the south of and provides an alternate route parallel to State Route 20 through a major part of the County.

Garden Highway is a north/south two lane roadway that extends from Second Street in Yuba City and continues south joining State Route 99 near Tudor. Garden Highway diverges from State Route 99 near Nicolaus and extends south along the Feather River and then along the Sacramento River towards the City of Sacramento. Garden Highway serves as an alternative north/south route to State Route 99 south of Yuba City.

Garmire Road is a north/south two lane roadway that extends from Moroni Road in the north to Cranmore Road in the south. A segment of this roadway forms part of the road system that fronts the Sacramento River through the County.

George Washington Boulevard is a north/south two lane roadway that extends from State Route 20 in the north to State Route 113 at Tudor Road in the south. George Washington Boulevard provides an alternate route parallel to and west of State Route 99.

Harter Road is a north/south two lane roadway extending from Butte House Road in the north to State Route 20 in the south.

Hooper Road is a north/south two lane roadway extending from True Road in the north to Colusa Frontage Road in the south.

Howsley Road is an east/west two lane roadway that extends from State Route 99 in the west through the community of Pleasant Grove to the Placer County line in the east.

Kirkville Road is an east/west two lane roadway that extends from Cranmore Road in Kirkville to Reclamation Road in the east and continues from Sacramento Valley Boulevard to Sacramento Road, east of State Route 113.

Larkin Road is a north/south two lane roadway located west of State Route 99 that extends from Eager Road in the south to Pennington Road in the north in the City of Live Oak. The roadway continues from Pennington Road, east of State Route 99, and extends north to Butte County.

Lincoln Road is an east/west two lane roadway that extends from Clements Road in the west and, after intersecting with State Route 99, ends at Garden Highway in the east.

Live Oak Boulevard is a north/south two lane roadway extending from State Route 99 and just south of Encinal Road to Yuba City in the south, where the roadway terminates at State Route 20.

Nicolaus Avenue is an east/west two lane roadway that serves the communities of Nicolaus, East Nicolaus, and Trowbridge and provides regional access by connecting to State Route 70 and State Route 99. Nicolaus Avenue extends from Pleasant Grove Road in the east to State Route 99 in the west.

O'Banion Road is an east/west two lane roadway that extends from Garden Highway in the east and, after intersecting with State Route 99, ends just west of Boulton Road.

Oswald Road is an east/west two lane roadway that extends from Railroad Avenue in the east to Schlag Road in the west and continues from west of the Sutter Bypass at Hughes Road to Meridian Road.

Pacific Avenue is a north/south two lane roadway that extends from Howsley Road to Rio Oso Road in the community of Rio Oso. Pacific Avenue provides direct access between the communities of Trowbridge and Rio Oso.

Pease Road is an east/west two lane roadway that extends from Live Oak Boulevard in the east to Township Road in the west.

Pelger Road is an east/west two lane roadway that provides access to the community of Cranmore from State Route 113. Pelger Road extends from State Route 113 in the east to Cranmore Road in the west.

Pennington Road is an east/west two lane roadway that extends from the City of Live Oak in the east to Powell Road in the west. This roadway is part of the circulation system that surrounds the Sutter Buttes and, in addition, provides regional access to the community of Pennington.

Pleasant Grove Road is a north/south two lane roadway that is parallel to and east of State Routes 70 and 99 and extends from Riego Road in the south to the Yuba County line in the north. Pleasant Grove Road serves as a local alternative north/south route to the state highways. From the County line, Pleasant Grove Road continues north as Forty Mile Road in Yuba County.

Railroad Avenue is a north/south two lane roadway that extends from Messick Road in the south to north of Richland Road in Yuba City.

Reclamation Road is a two lane rural roadway that extends from Ensley Road in a northwestern direction through the community of Robbins, crossing State Route 113 before terminating at Acme Road near Tisdale. This roadway along with Progress Road, McGrath Road and Tarke Road serves as a direct route between State Route 113/Robbins and State Route 20/Meridian bypassing the urbanized Yuba City section of the County.

Richland Road is an east/west two lane roadway that extends from Garden Highway in the east to Walton Avenue in the west.

Riego Road is an east/west two lane roadway that is a continuation of Base Line Road in Placer County and extends west intersecting State Route 99 before terminating at Garden Highway. Riego Road (Baseline Road) provides local access to the City of Roseville urban area in Placer County.

Rio Oso Road is an east/west two lane roadway extending from State Route 70 east through the community of Rio Oso to Warren Road.

South Butte Road is an east/west two lane roadway extending from State Route 20 west of Township Road through the community of Sutter to West Butte Road. There is also a section connecting Tarke Road to Hageman Road north of State Route 20.

Stewart Road is an east/west two lane roadway that extends from Garden Highway to Walton Avenue.

Tierra Buena Road is a north/south two lane roadway that extends from Hooper Road in Tierra Buena to Eager Road.

Township Road is a two part, north/south two lane roadway. South Township Road extends from Tudor Road in the south to Franklin Road in the north. North Township Road extends from Franklin Road north to Nuestro Road and then continues north from Clark Road to the Butte County line.

Walton Avenue is a north/south two lane roadway that extends from Oswald Road in the south to State Route 20 in the north.

West Butte Road is a north/south two lane roadway that extends from North Butte Road in the north to South Butte Road in the south. This roadway is part of the circulation system that surrounds the Sutter Buttes.

West Catlett Road is an east/west two lane roadway that extends from State Route 99 and State Route 70 in the east to Garden Highway in the west.

4.6 ROADWAY ANALYSIS METHODOLOGY

To quantitatively evaluate traffic operating conditions and to provide a basis for comparison of operating conditions, roadway Levels of Service were determined. Level of Service (LOS) as defined in the 1985 Highway Capacity Manual is "a quantitative measure describing operational conditions within a traffic stream, and their perception by motorists and/or passengers". LOS definitions generally describe these conditions in terms of such factors as speed and travel time, freedom to maneuver, traffic flow interruptions, comfort and convenience, and safety. Six levels of service are defined and given letter designations, from "A" to "F", with LOS "A" representing the best operating conditions and LOS "F" the worst. Table 4.6-1 presents the characteristics associated with each LOS grade.

TABLE 4.6-1
LEVEL OF SERVICE DEFINITIONS

- Level of Service A represents free flow. Excellent level of comfort, convenience and freedom to maneuver.
- Level of Service B is in the range of stable flow, but the presence of other road users in the traffic stream causes noticeable reductions of comfort, convenience and maneuvering freedom.
- Level of Service C is in the range of stable flow, but the operation of individual users is significantly affected by interaction with others in the traffic stream.
- Level of Service D represents high-density, but stable flow. Users experience severe restriction in speed and freedom to maneuver, with poor levels of comfort and convenience.
- Levels of Service E represents operating conditions at or near the capacity level. All speeds are reduced to a low, but relatively uniform value. Freedom to maneuver is difficult, with users experiencing frustration and poor comfort and convenience. Unstable operations are frequent, where small increases or minor perturbations to the traffic flow can cause breakdown conditions.
- Level of Service F is used to define forced or breakdown conditions. This condition exists wherever the amount of traffic approaching a point exceeds the amount that can traverse a point. Roadways store long queues behind such locations, with traffic advancing in stop-and-go "waves".

Source: 1985 Highway Capacity Manual, Transportation Research Board (TRB) Special Report 209.

LOS is often quantified by determination of a "volume to capacity" (V/C) ratio. V/C is a measurement of the amount of capacity of roadway that is being absorbed by traffic and is simply the volume of traffic on the roadway divided by the capacity of roadway. LOS represents a range of the roadway utilization, corresponding to V/C ratios. A V/C ratio of 1.00 represents complete utilization of available roadway capacity.

Local governments adopt LOS standards for roadways under their jurisdiction. Generally, LOS "C" or "D" is considered adequate, although some communities adopt higher or lower standards depending on the circumstances and the needs of the community. Sutter County utilizes LOS "D" as the minimum acceptable standard.

ROADWAY CAPACITY

The capacity of a roadway segment is the maximum rate at which vehicles can be expected to traverse a point or section of facility for a given period of time. The **1985 Highway Capacity Manual (HCM)** contains the standard procedures used for the analysis of highway capacity and level of service for most types of facilities.

The HCM defines levels of service for freeways and rural expressways (multi-lane highways) in terms of the density of vehicles on the road; that is vehicles per miles per lane. This measure relates best to a vehicle's freedom to maneuver and proximity to other vehicles.

For rural two-lane roadways, the HCM defines levels of service using percent-time delay as the primary measure. This is the average percent of the time that vehicles are delayed while traveling in platoons because of the inability to pass. Passing demand increases rapidly as traffic volumes increase, while passing capacity in the opposing lane declines as volumes increase. Thus, unlike other types of uninterrupted flow facilities, on two lane facilities, normal traffic flow in one direction influences flow in the other direction. Motorists are forced to adjust their individual travel speed as volumes increase and the ability to pass declines. In conjunction with this, terrain, shoulder width, percent of heavy vehicles, and available access points are important considerations.

For rural two-lane roads, the HCM presents an estimated maximum average daily traffic (ADT) of 20,800 for level terrain and a threshold of 12,200 ADT for LOS "D". This is based on a K factor (design hour factor, i.e., the proportion of ADT expected to occur in the design hour, usually the PM peak hour) of 10% and other standard assumptions for directionality of flow, heavy vehicle percentage, passing opportunity and roadway geometrics.

A typical daily volume assumed to correspond with peak hour capacity (i.e., LOS "E" to LOS "F" threshold) of an urban roadway would be calculated as follows:

	1800	vehicles per hour per lane (an average urban saturation flow rate)
x	0.50	fraction of time right-of-way is given (g/c) in the case of major cross streets
x	100/60	total volume/greater direction volume (@ 60:40 directionality)
x	1/0.10	daily volume/peak hour volume
=	15,000	vehicles per day per two lanes (theoretical capacity)

The 15,000 vpd capacity threshold is based on ideal conditions and may vary depending on various conditions. To reflect traffic operating conditions in the urbanized areas of Sutter County and the City of Yuba City, the Levels of Service thresholds were calibrated in the study Traffic Impact Fee Study for Sutter County/Yuba City, 1993.

Table 4.6-2 shows the Levels of Service thresholds and capacities for various roadway facilities.

TABLE 4.6-2**ROADWAY LEVELS OF SERVICE THRESHOLDS**

Roadway	LOS C	LOS D	LOS E
Urban - Two Lane	11,520-13,170	13,170-14,800	14,800-16,460
Urban - Three Lane	15,330-17,520	17,520-19,700	19,700-21,900
Urban - Four Lane	23,050-26,340	26,340-29,640	29,640-32,930
Rural - Two Lane	4,400-7,200	7,200-12,200	12,200-20,800
Expressway - Four Lane	30,400-38,900	38,901-47,400	47,401-51,600
Freeway - Four Lane	45,600-65,000	65,001-78,500	78,501-84,400
Freeway - Six Lane	68,400-97,500	97,501-117,800	117,801-126,700

4.7 EXISTING TRAFFIC OPERATING CONDITIONS

To assess the traffic operating conditions of the street system in Sutter County, existing daily traffic count information was collected from both the State and the County. Using the existing ADT's, Levels of Service for primary roadways in Sutter County were evaluated. Tables 4.7-1 and 4.7-2 show the existing Levels of Service on the State Highways and County roadway segments. A graphical representation of the existing roadway Levels of Service are shown on Figure 4.7-1.

As indicated by Table 4.7-1, all state highway segments currently operate at LOS "E" or better. A review of Caltrans Route Concept and Development Reports (RCDR) for all state highway segments indicate all segments are within their respective concept LOS standard.

As shown in Table 4.7-2, all County roadways are currently operating at, or better than, the County minimum standard of LOS "D" or better.

**TABLE 4.7-1
EXISTING OPERATING CONDITIONS ON STATE HIGHWAY SEGMENTS**

Facility	Classification	Lanes	Daily Volume	LOS
State Route 20				
Colusa County Line - Sutter Bypass	RA	2	5,300	C
Sutter Bypass - Acacia Avenue	RA	2	6,500	C
Acacia Avenue - Township Road	Expwy	4	6,100	A
Township Road - Geo. Washington Boulevard	Expwy	4	10,000	A
Geo. Washington Boulevard - Yuba City Limits	Expwy	4	13,900	A
State Route 70				
Junction 99 - Yuba County Line	RA	2	10,300	D
State Route 99				
Sacramento County Line - Junction Route 70	Expwy	4	22,000	C
Junction 70 - Garden Highway	RA	2	9,500	D
Garden Highway - Junction Route 113	RA	2	8,600	D
Junction Route 113 - Oswald Road	RA	2	11,500	D
Oswald Road - Bogue Road	RA	2	14,500	E
Bogue Road - Lincoln Road	RA	2	15,600	E
Lincoln Road - Franklin Road	Expwy	4	22,200	B*
Franklin Road - Junction Route 20	Expwy	4	28,800	E*
Junction Route 20 - Eager Road	Fwy	4	13,000	A
Eager Road - End Freeway	Fwy	4	11,000	A
End Freeway - Encinal Road	RA	2	14,700	D**
Encinal Road - Pennington Road	RA	2	16,600	E
Pennington Road - Butte County Line	RA	2	11,500	D
State Route 113				
Yolo County Line - Knights Road	RA	2	5,100	B
Knights Road - Del Monte Avenue	RA	2	5,500	C
Del Monte Avenue - Junction Route 99	RA	2	4,800	B

Fwy - Freeway, Expwy - Expressway, RA - Rural Arterial, UA - Urban Arterial, UC - Urban Collector, RC - Rural Collector

*LOS based on Intersection LOS in the Urban Area

**LOS is a result of highway transition from 4 to 2 lanes

TABLE 4.7-2
EXISTING OPERATING CONDITIONS ON SELECTED SUTTER COUNTY
RURAL AND URBAN ROADWAY SEGMENTS

Roadway Segment	Classification	Lanes	Daily Volume	LOS
Acacia Avenue				
Butte House Road - State Route 20	RC	2	3030	B
Bear River Drive				
Placer County - Pleasant Grove Road	RC	2	520	A
Bogue Road				
Garden Highway - State Route 99	UC	2	2220	A
State Route 99 - Walton Avenue	RC	2	2260	B
Broadway				
Nuestro Road - Clark Road	RC	2	860	A
Butte House Road				
Yuba City Limit - Harter Road	UA	2	12,400	C
Harter Road - Hooper Road	UA	2	8060	A
Hooper Road - Township Road	UA	2	4490	A
Township Road - Humphrey Road	RA	2	3100	B
Humphrey Road - Acacia Avenue	RA	2	3140	B
Catlett Road				
Placer County Line - State Route 99/70	RC	2	280	A
El Margarita Road				
Franklin Road - State Route 20	RC	2	1210	A
Franklin Road				
State Route 99 - Walton Avenue	UA	2	8790	B
Walton Avenue - El Margarita	UA	2	7410	B
El Margarita - Geo. Washington Boulevard	RA	2	5860	C
Geo. Washington Blvd - Township Road	RA	2	4670	C
Township Road - Acacia Road	RA	2	800	A
Garden Highway				
North of Lincoln Road	UA	3	10510	A
Yuba City Limits - State Route 99	RA	2	2360	B
State Route 99 - West Catlett Road	RA	2	360	A
West Catlett Road - Sankey Road	RA	2	200	A
Sankey Road - Riego Road	RA	2	340	A

TABLE 4.7-2 CON'T.

Roadway Segment	Classification	Lanes	Daily Volume	LOS
George Washington Boulevard				
State Route 113 - Oswald Road	RA	2	1540	A
Oswald Road - Lincoln Road	RA	2	3070	B
Lincoln Road - Franklin Road	RA	2	3180	B
Franklin Road - State Route 20	RA	2	6120	C
Harter Road				
State Route 20 - Butte House Road	UC	2	1510	A
Hooper Road				
Colusa Frontage Road - Butte House Road	UC	2	2440	A
Howsley Road				
State Route 99/70 - Placer County Line	RC	2	760	A
Larkin Road				
Eager Road - Clark Road	RA	2	1430	A
Clark Road - Live Oak City Limits	RA	2	1750	A
Lincoln Road				
West of Garden Highway	UA	2	5820	A
Jones Road - State Route 99	UA	2	10860	B
State Route 99 - Walton Avenue	UA	2	8580	B
Walton Avenue - Geo. Washington Blvd	RA	2	4670	C
Geo. Washington Blvd - Township Road	RA	2	630	A
West of Township Road	RA	2	290	A
Live Oak Boulevard				
Yuba City Limit - Pease Road	UA	2	7360	B
Pease Road - State Route 99	RA	2	5410	C
Nicolaus Avenue				
Pleasant Grove Road - State Route 70	RC	2	900	A
State Route 70 - State Route 99	RC	2	750	A
Oswald Road				
Railroad Avenue - State Route 99	RC	2	810	A
State Route 99 - Geo. Washington Blvd	RC	2	960	A
Geo. Washington Blvd - Township Road	RC	2	540	A

TABLE 4.7-2 CON'T.

Roadway Segment	Classification	Lanes	Daily Volume	LOS
Pease Road				
Township Roa - Tierra Buena Road	RC	2	370	A
Tierra Buena Road - State Route 99	UC	2	850	A
State Route 99 - Live Oak Boulevard	UC	2	1490	A
Pennington Road				
Live Oak City Limits - Township Road	RA	2	1710	A
Township Road - Pennington	RA	2	1190	A
Pleasant Grove Road				
Riego Road - Howsley Road	RA	2	1670	A
Howsley Road - Catlett Road	RA	2	1210	A
Catlett Road - Nicolaus Road	RA	2	1090	A
Nicolaus Road - Bear River Drive	RA	2		
Bear River Drive - Yuba County	RA	2	1760	A
Progress Road				
McClatchy Road - Acme Road	RA	2	400	A
Railroad Avenue				
Oswald Road - Bogue Road	RC	2	2360	B
Reclamation Road				
State Route 113 - Acme Road	RA	2	400	A
Richland Road				
Clark Avenue - State Route 99	UC	2	2650	B
State Route 99 - Walton Avenue	UC	2	2050	A
Riego Road				
Placer County - State Route 99/70	RC	2	4110	B
State Route 99/70 - Garden Highway	RC	2	540	A
Sankey Road				
State Route 99/70 - Natomas Road	RC	2	440	A
Natomas Road - Pleasant Road	RC	2	140	A
Stewart Road				
Garden Highway - State Route 99	RC	2	560	A
State Route 99 - Walton Avenue	RC	2	170	A

TABLE 4.7-2 CON'T.

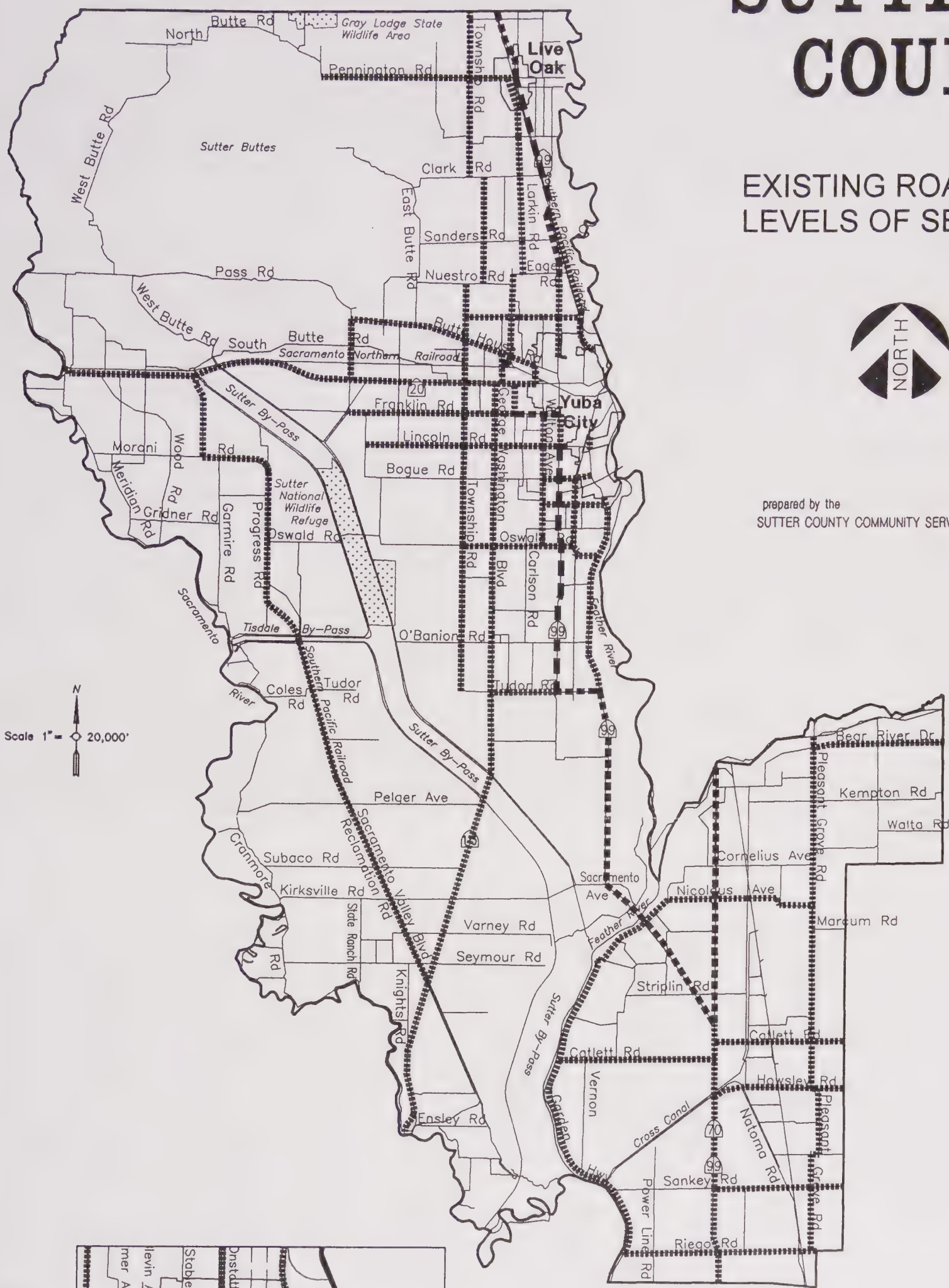
Roadway Segment	Classification	Lanes	Daily Volume	LOS
Tierra Buena Road				
Hooper Road - Pease Road	UC	2	2520	A
Pease Road - Eager Road	RC	2	1540	A
Township Road				
Tudor Road - Oswald Road	RA	2	460	A
Oswald Road - Lincoln Road	RA	2	860	A
Lincoln Road - Franklin Road	RA	2	1370	A
Franklin Road - State Route 20	RA	2	2260	B
State Route 20 - Butte House Road	RA	2	2520	B
Butte House Road - Nuestro Road	RA	2	1170	A
Clark Road - Pennington Road	RA	2	1160	A
Pennington Road - Butte County	RA	2	1070	A
Walton Avenue				
Oswald Road - Bogue Road	RA	2	1560	A
Bogue Road - Lincoln Road	UA	2	7170	A
Lincoln Road - Franklin Road	UA	2	6600	A
Franklin Road - Yuba City Limits	UA	2	11870	C
West Catlett Road				
State Route 99/70 - Garden Highway	RC	2	180	A

SUTTER COUNTY

EXISTING ROADWAY LEVELS OF SERVICE

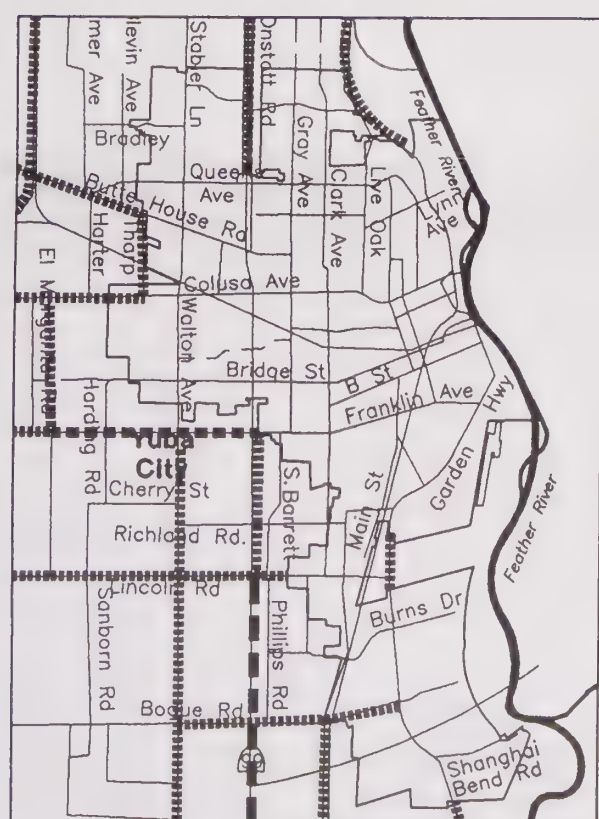


prepared by the
SUTTER COUNTY COMMUNITY SERVICES DEPARTMENT



Scale 1" = 20,000'

Scale 1" = 7,000'



LEGEND

- LOS C OR BETTER
- LOS D
- LOS E
- LOS F

FIGURE 4.7-1
EXISTING ROADWAY
LEVELS OF SERVICE

4.8 TRAFFIC ACCIDENT HISTORY

Recent accident history in Sutter County was researched to identify primary accident factors and high accident locations. The purpose of this investigation was to identify any problems that may be addressed within the scope of the transportation planning for the General Plan, which may lead to identification of general goals for safety improvement on County roads. This is not a detailed traffic engineering study of County road accidents.

The accident history for roadways between 1990 and 1994 were obtained from the Statewide Integrated Traffic Record System (SWITRS). SWITRS does not include accident information for streets within the jurisdictions of the Cities of Yuba City and Live Oak and/or information on state highways. Table 4.8-1 summarizes the accident types for the five year period and Table 4.8-2 lists the intersection locations with six or more accidents within 200 feet for years 1990 through 1992.

**TABLE 4.8-1
COUNTY ROAD ACCIDENT SUMMARY**

Year	PDO	Injury Accidents	Fatal Accidents	Total Accidents
1990	155	119	9	283
1991	114	134	4	252
1992	130	115	8	253
1993	139	100	5	244
1994	125	137	7	269
Total	663	605	33	1,301

PDO = Property Damage Only

As indicated by Table 4.8-1, Sutter County experienced a high of 283 total accidents in 1990 with nine (9) accidents involving a fatality and a low of 244 total accidents during 1993 of which five (5) involved a fatality.

TABLE 4.8-2**INTERSECTIONS WITH SIX OR MORE ACCIDENTS IN 1990 - 1992**

No. of Accidents	Intersection
9	Garden Highway/Lincoln Avenue
9	Pease Road/Tierra Buena Road
7	Riego Road/Natomas Road
6	Bogue Road/Walton Avenue
6	Pleasant Grove Road/Sankey Road

As shown in Table 4.8-2, the highest accident locations averaged between two (2) to three (3) accidents per year. The majority of accidents at the intersections were broadside, reflecting conflicts in right-of-way. A closer inspection of the individual intersection locations should be performed to identify potential improvements in intersection controls.

4.9 FUTURE TRAFFIC CONDITIONS AND IMPROVEMENT REQUIREMENTS

In order to generate traffic data for this report, reasonable population and growth projections were needed for the County. As such, SACOG population data has been utilized for modeling purposes. The population projections from SACOG include assumptions about future growth throughout the County, with major growth projected in the Yuba City Urban Area.

PROPOSED AND PLANNED DEVELOPMENTS AND TRANSPORTATION PROJECTS IN ADJACENT JURISDICTIONS

Sutter County is surrounded by six counties, including Yuba, Placer, Sacramento, Yolo, Colusa and Butte Counties. In addition, directly across the Feather River to the east is the City of Marysville. Major development in any one of these jurisdictions could affect travel demand and road improvement requirements on the Sutter County street system. Yuba and Placer Counties are the only two counties which have active major development projects that could influence travel demand on the Sutter County street system. No other major development or circulation improvement proposals are planned in other adjacent jurisdictions.

In Yuba County, several development projects have been proposed and approved to various stages which could add to cumulative traffic on Highways 99 and 70. The Plumas Lake specific plan was approved in September of 1993 and would result in some 11,750 dwelling units at build-out. Plumas Lake is located in the vicinity of the proposed third bridge crossing between Sutter and Yuba Counties. Additionally, specific plans have been approved for: East Linda - 5,500 dwelling units,

114 acres of commercial; Spring Valley - 3,503 dwelling units; and, River Highlands - 9,372 dwelling units. Very little development has occurred in any of these specific plan areas and is not expected to occur until the economy rebounds. Additionally, significant service and facilities improvements will be required for most of these areas to develop.

Placer County completed an update of its general plan in August of 1994 and no new major developments were proposed near Sutter County. A large project which could affect State Route 99/70 is the Twelve Bridges development. This project has been annexed to the city of Lincoln and will include a variety of land uses, including several thousand dwelling units, as well as an expansion of the Sierra College campus. Additionally, a West Placer Specific Plan is under discussion for land directly east of the Sutter County line, with the north boundary of the plan area Baseline Road (the extension of Sutter County's Riego Road) and the south boundary the Sacramento County line. While no formal application has been submitted as of February 1996, it is anticipated that the specific plan will proceed, encompassing 5,000 acres and providing up to 14,000 dwelling units.

In addition to the planned third bridge crossing of the Feather River, identified in the State Route 70 and State Route 99 Corridor Study, July, 1990, is a fourth bridge crossing proposal north of the existing bridges. It is not anticipated that this fourth bridge crossing will be significantly contemplated until the third bridge crossing is constructed.

TRAFFIC PROJECTIONS AND CIRCULATION IMPROVEMENT REQUIREMENTS

The 2015 future traffic projections were determined using travel demand forecasting models. These traffic models (PM peak hour and daily traffic flows) were developed by OMNI-MEANS for the Bi-County Transportation Agency as a part of the state mandated Congestion Management Program for Sutter and Yuba Counties. Since the preparation of the initial Congestion Management Program Study, conducted in 1991, the models have subsequently been updated and used for the Yuba County Traffic Impact Fee Study, the Sutter County/Yuba City Traffic Impact Fee Study and the 1993 Congestion Management Program Update, all conducted by OMNI-MEANS.

Concurrent with the use of the Sutter/Yuba Counties traffic models developed by OMNI-MEANS, Caltrans also commissioned the development of traffic models for the same area, but forecasting to the year 2020. This new Caltrans model similarly uses the MINUTP software and results in generally consistent traffic projections for likely increased travel demand ten years hence.

The travel demand forecasting models used perform the traditional travel demand forecasting procedure, but facilitate these procedures on a personal computer. This allows for rapid testing of land use scenarios and street system alternatives. The traditional forecasting procedure consists of trip generation, trip distribution and trip assignment. Trip generation is the quantification of the amount of traffic generated by applying a trip rate, normally taken from publications of standard trip rates, to the land use or socio-economic variable. Trip distribution is a determination of where the traffic is going to (destination) and leaving from (origin). Trip assignment is the accumulation of traffic on specific roadways which link the origin and destination of trips. As a final step to the model development process, the models are calibrated to simulate the traffic flows over a base year,

for this project, it was 1991. Upon calibration of the models, future land use data was input to the models to project future travel demand and identify future circulation improvement requirements. Using the daily traffic projections from the traffic demand model the year, 2010 roadway traffic conditions were evaluated. This future year analysis assumed, as previously discussed, the third bridge crossing over the Feather River. This assumed bridge crossing connected Bogue Road at Garden Highway and Feather River Boulevard/Erle Road in Yuba County. Tables 4.9-1 and 4.9-2 show the future roadway levels of service of the State Highways and County roadway segments, respectively. The operating conditions presented in Tables 4.9-1 and 4.9-2 identify conditions which would exist at 2015 general plan build out if no roadway improvements are made. Figure 4.9-1 graphically presents future Levels of Service on Sutter County roadways.

TABLE 4.9-1

FUTURE PROJECTED OPERATING CONDITIONS ON STATE HIGHWAY SEGMENTS

Facility	Classification	Lanes	Daily Volume	LOS
State Route 20				
Colusa County Line - Sutter Bypass	RA	2	9,700	D
Sutter Bypass - Acacia Avenue	RA	2	22,100	F
Acacia Avenue - Township Road	Expwy	4	20,200	E
Township Road - Geo. Washington Boulevard	Expwy	4	27,500	C
Geo. Washington Boulevard - Yuba City Limits	Expwy	4	37,700	C
State Route 70				
Junction 99 - Yuba County Line	RA	2	21,200	F
State Route 99				
Sacramento County Line - Riego Road	Expwy	4	122,200	F
Riego Road - Sankey Road	Expwy	4	76,400	F
Sankey Road - Howsley Road	Expwy	4	58,500	F
Howsley Road - State Route 70	Expwy	4	47,300	D
Junction 70 - Garden Highway	RA	2	28,700	F
Garden Highway - Junction Route 113	RA	2	39,800	F
Junction Route 113 - Oswald Road	RA	2	20,200	E
Oswald Road - Bogue Road	RA	2	30,600	F
Bogue Road - Lincoln Road	RA	2	32,500	F
Lincoln Road - Franklin Road	Expwy	4	36,000	C
Franklin Road - Junction Route 20	Expwy	4	41,800	D
Junction Route 20 - Eager Road	Fwy	4	22,700	C
Eager Road - End Freeway	Fwy	4	16,000	C
End Freeway - Encinal Road	RA	2	21,200	F
Encinal Road - Pennington Road	RA	2	21,800	F
Pennington Road - Butte County Line	RA	2	16,400	E
State Route 113				
Yolo County Line - Knights Road	RA	2	19,600	E
Knights Road - Del Monte Avenue	RA	2	19,600	E
Del Monte Avenue - Junction Route 99	RA	2	19,700	E

Fwy = Freeway; Expwy = Expressway; RA = Rural Arterial, UA = Urban Arterial, UC = Urban Collector, RC = Rural Collector

TABLE 4.9-2 CON'T.

TABLE 4.9-2

**SUTTER COUNTY ROADWAY FUTURE PROJECTED OPERATING CONDITIONS
ON SUTTER COUNTY RURAL AND URBAN ROADWAY SEGMENTS**

Roadway Segment	Classification	Lanes	Daily Volume	LOS
Acacia Avenue				
Butte House Road - State Route 20	RC	2	9,700	D
Bear River Drive				
Placer County - Pleasant Grove Road	RC	2	8,600	C
Bogue Road				
Garden Highway - State Route 99	UC	2	3,700	C
State Route 99 - Walton Avenue	RC	2	6,800	C
Broadway				
Nuestro Road - Clark Road	RC	2	5,500	C
Butte House Road				
Yuba City Limit - Harter Road	UA	2	18,800	F
Harter Road - Hooper Road	UA	3	17,800	D
Hooper Road - Township Road	UA	2	8,900	C
Township Road - Humphrey Road	RA	2	9,800	D
Humphrey Road - Acacia Avenue	RA	2	12,900	E
Catlett Road				
Placer County Line - State Route 99/70	RC	2	7,100	C
El Margarita Road				
Franklin Road - State Route 20	RC	2	4,800	C
Franklin Road				
State Route 99 - Walton Avenue	UA	2	9,700	C
Walton Avenue - El Margarita Road	UA	2	10,500	C
El Margarita Road - Geo. Washington Boulevard	RA	2	9,200	D
Geo. Washington Boulevard - Township Road	RA	2	7,400	C
Township Road - Acacia Road	RA	2	4,100	C
Garden Highway				
North of Lincoln Road	UA	2	10,700	C
Yuba City Limits - State Route 99	RA	2	11,600	D
State Route 99 - West Catlett Road	RA	2	11,300	D
West Catlett Road - Sankey Road	RA	2	19,400	E
Sankey Road - Riego Road	RA	2	8,200	D

TABLE 4.9-2 CON'T.

Roadway Segment	Classification	Lanes	Daily Volume	LOS
George Washington Boulevard				
State Route 113 - Oswald Road	RA	2	7,500	D
Oswald Road - Lincoln Road	RA	2	4,200	C
Lincoln Road - Franklin Road	RA	2	5,400	C
Franklin Road - State Route 20	RA	2	7,700	D
Harter Road				
State Route 20 - Butte House Road	UC	2	8,000	C
Hooper Road				
Colusa Frontage Road - Butte House Road	UC	2	6,300	C
Howsley Road				
State Route 99/70 - Placer County Line	RC	2	19,500	E
Larkin Road				
Eager Road - Clark Road	RA	2	5,300	C
Clark Road - Live Oak City Limits	RA	2	4,100	C
Lincoln Road				
West of Garden Highway	UA	2	12,300	C
Jones Road - State Route 99	UA	2	17,800	F
State Route 99 - Walton Avenue	UA	2	7,300	C
Walton Avenue - Geo. Washington Boulevard	UA/RA	2	10,300	D
Geo. Washington Boulevard - Township Road	RA	2	2,600	C
West of Township Road	RA	2	900	C
Live Oak Boulevard				
Yuba City Limit - Pease Road	UA	2	12,500	C
Pease Road - State Route 99	RA	2	9,700	D
Nicolaus Avenue				
Pleasant Grove Road - State Route 70	RC	2	4,300	C
State Route 70 - State Route 99	RC	2	4,300	C
Oswald Road				
Railroad Avenue - State Route 99	RC	2	1,300	C
State Route 99 - Geo. Washington Boulevard	RC	2	3,100	C
Geo. Washington Boulevard - Township Road	RC	2	800	C
Pease Road				
Township Road - Tierra Buena Road	RC	2	600	C

TABLE 4.9-2 CON'T.

Roadway Segment	Classification	Lanes	Daily Volume	LOS
Tierra Buena Road - State Route 99	UC	2	1,200	C
State Route 99 - Live Oak Boulevard	UC	2	1,200	C
Pennington Road				
Live Oak City Limits - Township Road	RA	2	3,200	C
Township Road - Pennington	RA	2	1,500	C
Pleasant Grove Road				
Riego Road - Howsley Road	RA	2	14,900	E
Howsley Road - Catlett Road	RA	2	11,800	D
Catlett Road - Nicolaus Road	RA	2	13,500	E
Nicolaus Road - Bear River Drive	RA	2	6,200	C
Bear River Drive - Yuba County	RA	2	15,500	E
Progress Road				
McClatchy Road - Acme Road	RA	2	5,800	C
Railroad Avenue				
Oswald Road - Bogue Road	RC	2	1,700	C
Reclamation Road				
State Route 113 - Acme Road	RA	2	5,000	C
Richland Road				
Clark Avenue/Bunce Road - State Route 99	UC	2	2,600	C
State Route 99 - Walton Avenue	UC	2	4,500	C
Riego Road				
Placer County - State Route 99/70	RC	2	49,600	F
State Route 99/70 - Garden Highway	RC	2	51,100	F
Sankey Road				
Garden Highway - State Route 99/70	RC	2	47,200	F
State Route 99/70 - Natomas Road	RC	2	32,800	F
Natomas Road - Pleasant Grove Road	RC	2	17,300	E
Stewart Road				
Garden Highway - State Route 99	RC	2	700	C
State Route 99 - Walton Avenue	RC	2	2,000	C
Tierra Buena Road				
Hooper Road - Pease Road	UC	2	2,200	C
Pease Road - Eager Road	RC	2	2,500	C

TABLE 4.9-2 CON'T.

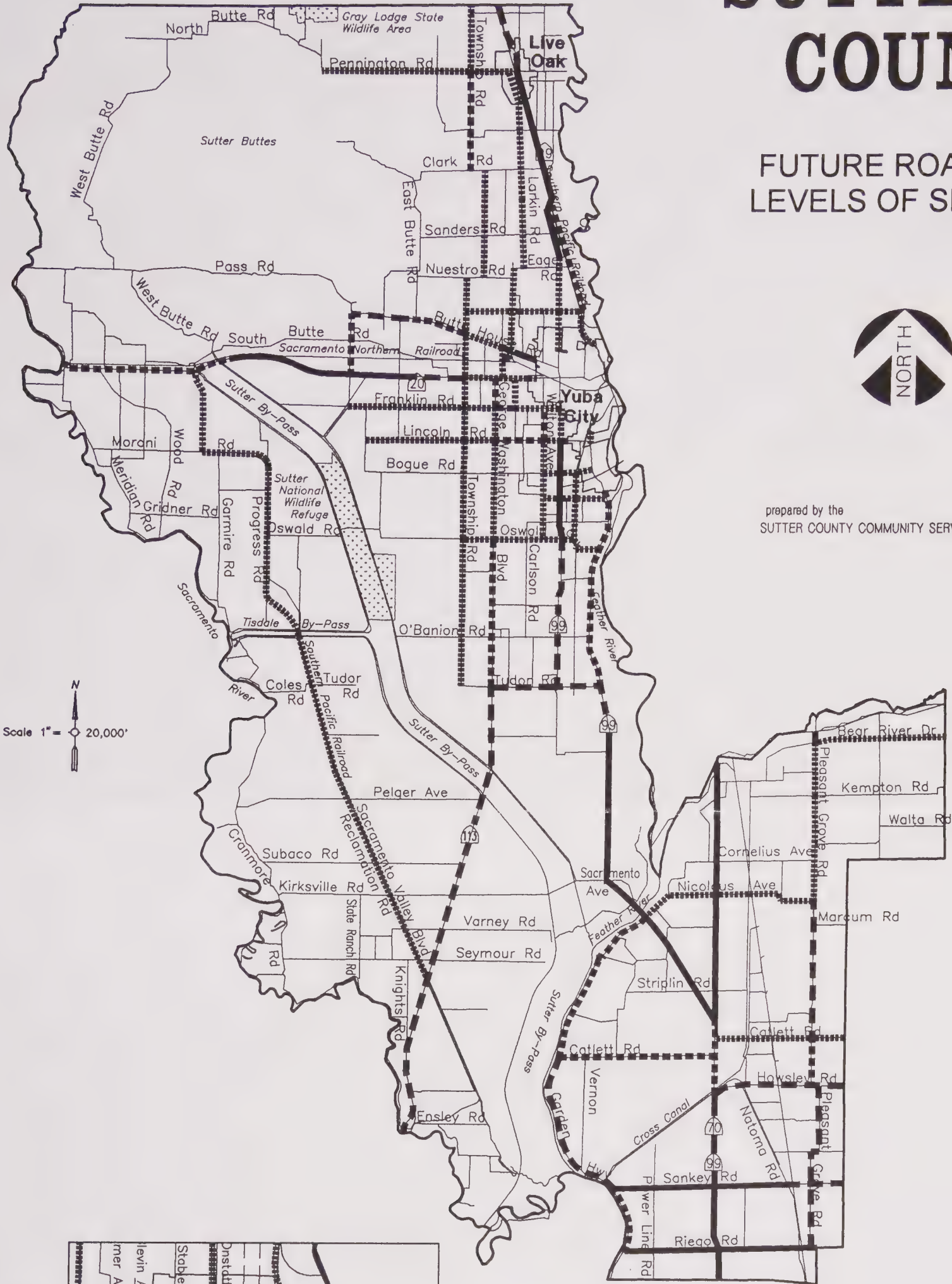
Roadway Segment	Classification	Lanes	Daily Volume	LOS
Township Road				
Tudor Road - Oswald Road	RA	2	800	C
Oswald Road - Lincoln Road	RA	2	2,800	C
Lincoln Road - Franklin Road	RA	2	2,100	C
Franklin Road - State Route 20	RA	2	4,400	C
State Route 20 - Butte House Road	RA	2	7,100	C
Butte House Road - Nuestro Road	RA	2	3,200	C
Clark Road - Pennington Road	RA	2	10,800	D
Pennington Road - Butte County	RA	2	7,200	C
Walton Avenue				
Oswald Road - Bogue Road	RA	2	3,400	C
Bogue Road - Lincoln Road	UA	2	9,700	C
Lincoln Road - Franklin Road	UA	2	13,900	D
Franklin Road - Yuba City Limits	UA	2	21,800	F
West Catlett Road				
State Route 99/70 - Garden Highway	RC	2	8,500	D

SUTTER COUNTY

FUTURE ROADWAY LEVELS OF SERVICE

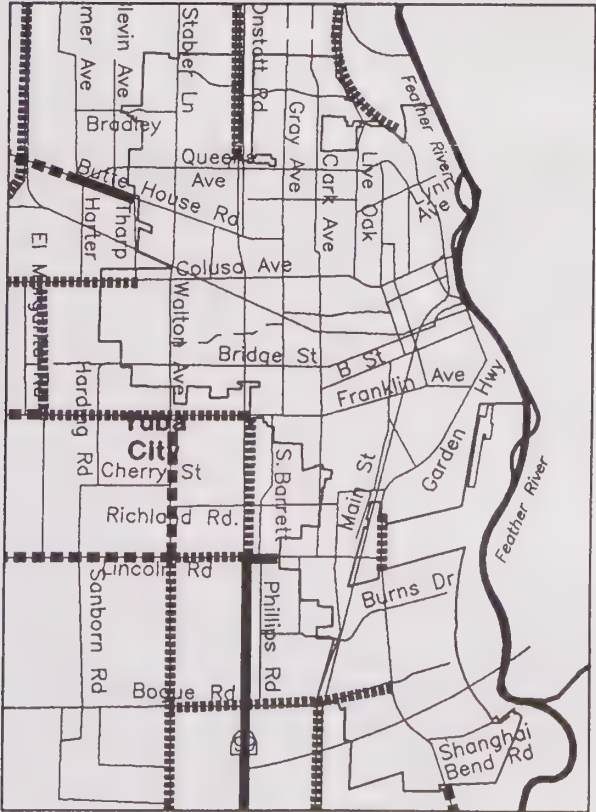


prepared by the
SUTTER COUNTY COMMUNITY SERVICES DEPARTMENT



Scale 1" = 20,000'

Scale 1" = 7,000'



LEGEND

- LOS C OR BETTER
- LOS D
- LOS E
- LOS F

NOTE: LEVEL OF SERVICE CONDITIONS DEPICT 2015 GENERAL PLAN BUILD-OUT WITHOUT MAJOR ROADWAY IMPROVEMENTS

FIGURE 4.9-1
FUTURE ROADWAY LEVELS OF SERVICE

The majority of state highways are projected to operate at unacceptable levels due to increase in regional travel demand. A comprehensive study was performed for the travel corridors along State Route 99 and State Route 70 from north of Sacramento to Chico in 1990. The recommendations for improvements are documented in the State Routes 70 and 99 Corridor Study, (July 1990). The following improvements are recommended within the State Route 70 and 99 Corridor Study and the Route Concept Reports.

The following are the improvements identified for the state highway segments in their respective Route Concept Reports (RCR).

State Route 20

No improvements were identified in the RCR. The capacity of the segment could be improved if the non-expressway portion of the segment is converted from a two lane conventional highway to a four lane expressway. This improvement would require widening of the Sutter Causeway.

State Route 70

The State Routes 70 and 99 Corridor Study (July 1990), recommends a four lane freeway facility from State Route 70's Junction with State Route 99 north to the junction with State Route 65 in Yuba County.

State Route 99

Sacramento County line to Junction Route 70: Widening of this segment to a four lane freeway is recommended in the Route Concept Report.

Intersection of Riego Road: Improvement will eventually include construction of a freeway interchange.

Junction Route 70 to Bogue Road: The Route Concept Report has identified the necessity of widening this segment from the junction with State Route 113 to Bogue Road to four lanes. The traffic projections also suggests widening the segment between Junction Route 70 to State Route 113 to a four lane expressway.

Bogue Road to State Route 20: The State Routes 70 and 99 Corridor Study, (July 1990) recommended this segment to be ultimately upgraded to a six lane expressway with an urban interchange at State Route 20.

End of freeway to Live Oak: The State Routes 70 and 99 Corridor Study, (July 1990) recommended this segment to be upgraded to a four lane expressway facility.

The State Route 70 and 99 Corridor Major Investment Study (MIS) was published in June of 1995. This study identifies “pipeline projects” that are viewed as initial investments (or stages) towards realizing the benefits of implementing the State Route 70 and 99 Corridor Study. The MIS is a major investment analysis that evaluates the efficiency and effectiveness of alternative investment strategies in attaining local, state and federal goals and objectives.

Pipeline projects listed within the MIS are considered initial investments (or stages) toward full implementation of the State Route 70 and 99 Corridor Study. The MIS identifies the following as pipeline projects within Sutter County.

- 4-lane freeway for SR 70 from the SR 70/SR 99 split north to the McGowen Parkway in Yuba County.
- 2-lane “Southern Crossing” of the Feather River on the Bogue-Erle Road alignment.
- Interchange at SR 20/SR 99 Intersection in Yuba City.

CORRIDOR PRESERVATION

The State Routes 70/99 Corridor Study was prepared and approved in 1990 by SACOG and the Butte County Association of Governments. The accompanying Draft Implementation Plan identifies the need to make other major improvements in the 70/99 corridor. While these improvements would provide additional access and increase safety for motorists, there is simply not enough money to make all the major improvements called for in the corridor study.

It should be stressed that major future cost savings can be realized by preserving right-of-way corridors for future road improvement projects. Protection of these potential rights-of-way from upzoning can help achieve this objective.

4.11 ROADWAY IMPROVEMENTS

Table 4.11-1 shows the roadway improvements identified to improve the operating conditions of the deficient roadways identified in Tables 4.9-1 and 4.9-2. Many of the improvements identified in Table 4.11-1 are included in the Traffic Impact Fee Study for Sutter County/Yuba City, (May 1993) report. Additional improvements have been identified through the General Plan environmental review process. The environmental review process utilized the most current data and traffic models in conjunction with the preferred land use alternative to identify required improvements. Recommended improvements vary from Caltrans studies in some instances.

**TABLE 4.11-1
SUTTER COUNTY ROADWAY IMPROVEMENTS**

Facility	Improvement*
State Route 20 Sutter Bypass - Humphrey Road	Widen to four-lane expressway
State Route 99 Sacramento County Line - Riego Road Riego Road - State Route 70 State Route 70 - Bogue Road Bogue Road - State Route 20 North of Eager Road - Butte County Line	Widen to six-lane freeway Widen to four-lane expressway Widen to four-lane expressway Widen to six lanes Widen to four lanes
State Route 70 State Route 99 - Yuba County Line	Widen to four-lane expressway
Third Feather River Bridge State Route 99 - Yuba County Line	Construct a two-lane, limited access facility
State Route 113 Yolo County Line - State Route 99	Widen to four lanes
Butte House Road Acacia Avenue - Humphrey Road Harter Road - Yuba City Limit	Upgrade to two-lane urban standards Widen to two lanes plus a center turn lane
Garden Highway Sankey Road - West Catlett Road Yuba City Limits - State Route 99	Upgrade travel lanes and shoulders Upgrade to two lane urban roadway standards
Howsley Road State Route 99 - Pleasant Grove Road	Upgrade/widen to four or six lanes
Lincoln Road Jones Road - Walton Avenue	Widen to two lanes plus a center turn lane
Pleasant Grove Road Sacramento County Line - Riego Road Riego Road - Howsley Road Howsley Road - Yuba County	Realign to the west and provide four lanes Widen to four lanes, realign south of Howsley Road Widen to four lanes
Riego Road Garden Highway - Placer County Line	Widen to four or six lanes depending on access
Sankey Road Garden Highway - State Route 99/70 State Route 99/70 - Placer County Line	Widen to four or six lanes depending on access Widen to four or six lanes depending on access
Walton Avenue Franklin Road - Bridge Street (Yuba City)	Widen to four lanes plus a center turn line

Note: *Improvements are based upon proposed land uses and 1995 SACOG regional population and employment forecasts for year 2015. Future roadway improvements may vary as new land uses and transportation facilities are developed.

Source: Fehr & Peers Associates, Inc., 1996

Sutter County is currently served by an extensive roadway system that is comprised of primarily rural roadways serving low intensity agricultural land uses. Automobile travel is the primary mode of transportation throughout the County.

Sutter County is a member of the Sacramento Area Council of Governments (SACOG) for which a Regional Transportation Plan (RTP) was prepared in 1992. SACOG includes Sacramento, Yolo, Yuba and Sutter Counties. This RTP addresses the regional transportation needs of these jurisdictions and incorporates a variety of transit modes. The overall goal is to provide transportation services and facilities that will modify existing urban forms, shape future urban forms, and otherwise influence land use change to make the most efficient and effective use of the region's transportation resources.

Fixed route and demand responsive transit services within Sutter County are described below. These services were available as of January, 1996.

FIXED ROUTE PUBLIC TRANSIT

Sutter County is served by the Yuba-Sutter Transit fixed route system. This system operates a Yuba City loop route, a Marysville loop, a Yuba City to Yuba College route, and a Yuba College to Olivehurst route. These services are available Monday through Friday from 6:30 a.m. to 6:30 p.m. The service runs every hour and the basic one way fare is one dollar. Senior/Disabled and Youth fares are provided at discount rates and transfers between routes are free.

Yuba Sutter Transit also provides a Sacramento Commuter Express that provides daily peak hour service to downtown Sacramento from Marysville and Yuba City. The Commuter Express offers four morning and four afternoon schedules. Regional Transit (RT) transfers are available at several stops.

Additionally there is a Midday Express service from Yuba City/Marysville to downtown Sacramento and major medical facilities every weekday which runs late morning and early afternoon. This service is provided on a first come first served basis with reservations required.

DEMAND RESPONSIVE TRANSPORTATION

The transportation needs of the elderly and disabled are provided for by Yuba Sutter Transit Dial-A-Ride. This is a demand responsive bus service that is provided on a first come, first served basis to those eligible for the service. The bus will pick up passengers at any address within the service area and take them to their destination. Persons age 62 and over or disabled are eligible for Dial-A-Ride service automatically. Other persons traveling to or from locations more than half-a-mile from the fixed routes may also be eligible. General public Dial-A-ride passengers are subject to transfer to the fixed route system if they travel across the service area. Transfers between the Dial-A-Ride and fixed route services are free.

This system operates within the Yuba City Urban Area and also serves Marysville, Linda and Olivehurst in Yuba County. The services are available Monday through Friday 6:30 a.m. to 6:30 p.m. and Saturday 9:00 a.m. to 3:00 p.m. No service is available on Sunday.

Yuba Sutter Transit also operates a reservation only route from Live Oak to Yuba City. Reservations must be made by 6:00 p.m. the day before, or the bus will not make the run that day. The service runs one round trip each weekday. The bus will pick up and deliver passengers anywhere within the Live Oak City Limits and anywhere within 1/4 mile of the route in Yuba City and Marysville.

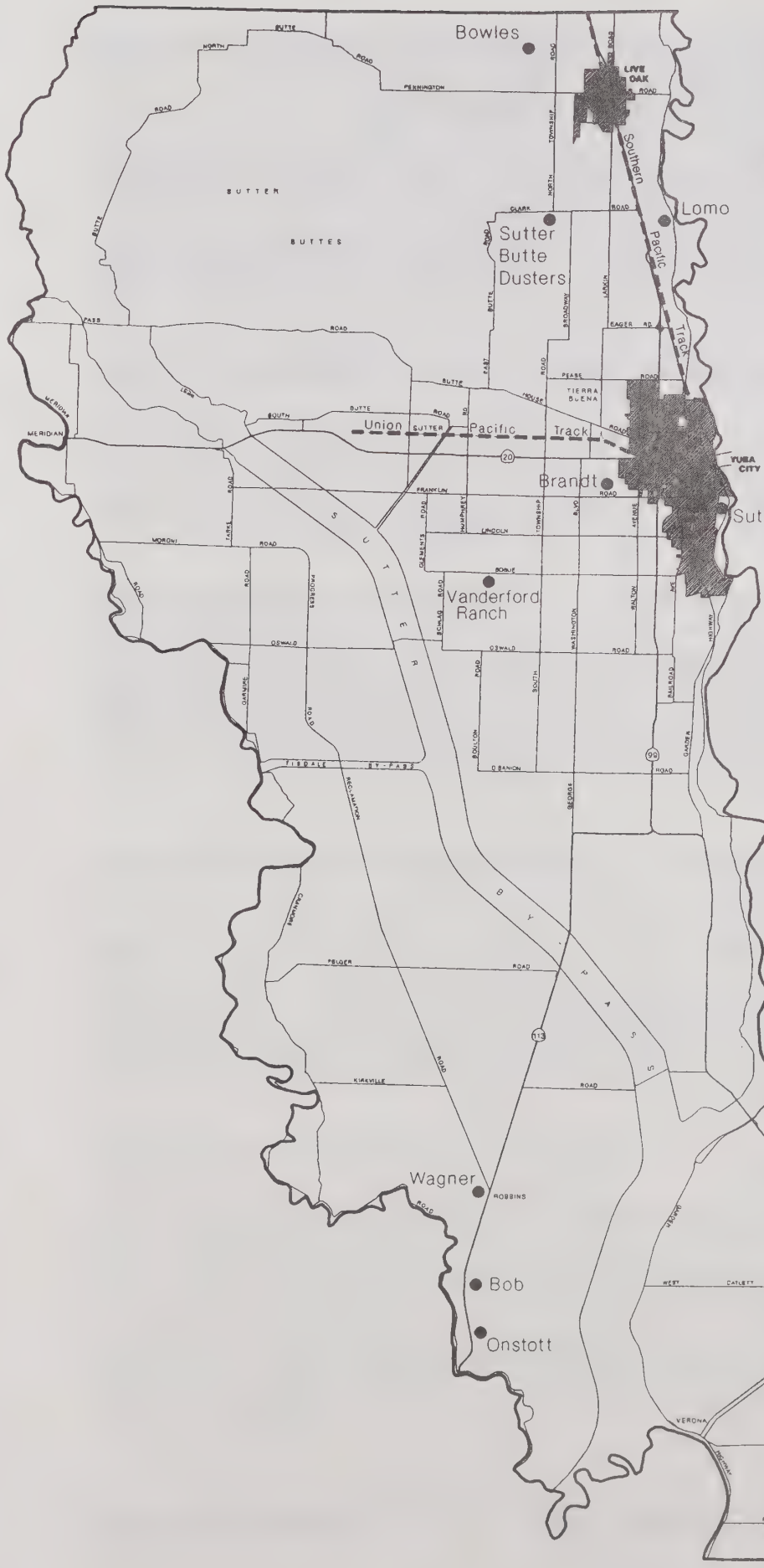
4.13 PASSENGER AND FREIGHT RAIL LINES, FACILITIES AND SERVICES

Rail service is available for the transport of agricultural goods and other materials by two railroad companies. The Union Pacific Railroad line runs through south Sutter County east of Highway 70 from Sacramento County to Yuba County. The Southern Pacific Railroad enters Sutter County north of Yuba City and continues northerly to Butte County. (See Figure 4.13-1).

Passenger service is only available in Marysville by way of the AMTRAK Coast Starlight train that runs from Los Angeles to Seattle with one stop daily in each direction. The limited hours of operation make this train service ineffective as a travel alternative for commuters. At the writing of this report, a study entitled the "Northern Sacramento Valley Intercity Passenger Rail Feasibility Study" is being conducted to evaluate opportunities of establishing intercity rail service from Sacramento to Redding. This study proposes the use of the Southern Pacific Railroad line as a commuter line for passenger service.

The Union Pacific line only provides freight service. It is anticipated that this use will continue into the foreseeable future.

No new rail lines are planned within Sutter County. Several railroad corridors have been abandoned in the past few years for various reasons, including high maintenance costs and limited use. The old Sacramento Northern Railroad right-of-way that parallels State Route 20 is scheduled to be abandoned and is proposed for development of a Class I bike/pedestrian path between Yuba City and the community of Sutter.



SUTTER COUNTY

AIRPORTS
and
RAILROADS



0 10000 20000
SCALE IN FEET

prepared by the
SUTTER COUNTY COMMUNITY SERVICES DEPARTMENT

Figure 4.13-1
Airports and Railroads

Air transportation in Sutter County is served by the Sutter County Airport near Yuba City. There are also numerous private airfields and heliports serving general aviation and agricultural users. Significant airport facilities are depicted on Figure 4.13-1 of this report.

State Law requires public access airports to develop Airport Comprehensive Land Use Plans, designating airport vicinity land use and clear zones. Such plans are to be adopted by the County's Airport Land Use Commission (ALUC), which for Sutter County is the Sacramento Area Council of Governments (SACOG).

SUTTER COUNTY AIRPORT

Sutter County Airport is surrounded to the north, south and west by Yuba City. The airport is located on 170 acres of land, and is operated by the Sutter County Public Works Department. It was established in 1947. The airport's single paved runway is 3,040 feet in length and 75 feet in width. The runway has medium intensity lighting, with a visual approach slope indicator at one end. There are 50 T-hangers, 85 open tie-downs, and 28 transient parking spaces. Services available at the airport include taxi service, flight instruction, aircraft repair, fuel sales, and rentals.

The most recent estimate of annual operations is 58,500. Ninety-two aircraft are currently based at the airport, along with one helicopter. A major portion of airport operations are a result of agricultural aircraft involved in crop dusting activities.

SACRAMENTO INTERNATIONAL AIRPORT

Sacramento International Airport is located directly south of the Sutter County line between Interstate 5 and the Sacramento River. This facility began operations in 1967 and is served by eight major carriers and four commuter lines. There are more than 130 scheduled departures every day to many major U.S. cities and all major California cities.

Currently, the airport has two runways, each 8,600 feet in length and 150 feet in width. Total aircraft operations in 1985, the most recent year noted in the 1994 Comprehensive Land Use Plan (CLUP), was 130,500. The CLUP contains projections of 149,000 and 167,000 aircraft operations for the years 1995 and 2000, respectively.

The 1994 CLUP adopted for Sacramento International Airport discusses planned expansions of facilities. Anticipated projects include improving roadway circulation within the airport and expanding the existing runways from 8,600 feet to 12,000 feet in length. Lengthening the runways will allow larger commercial airliners to utilize the airport and expand the service status of the facility to an International Airport. Figure 9 of the CLUP identifies a large area on the eastern perimeter of the existing airport as Metro Air Park Special Planning Area. However, this area is not discussed within the CLUP.

Extension of the existing runways will have a potentially significant impact on Sutter County. Lengthening the runways will extend the Approach/Departure Zone of the airport well into Sutter County. Land uses within Approach/Departure Zones are highly restricted, with agriculture and mining operations, cemeteries and natural reserves allowed under limited conditions.

Other Airport Facilities

Airport facilities are regulated by the California Department of Transportation Aeronautics Program. The Aeronautics Program issues permits for Public Use Airports, such as Sutter County Airport, and Special Use Airports. Special Use Airports in Sutter County include Wagner, Riego and Tenco Tractor facilities.

Two other types of airports, Personal Use and Agricultural, are not regulated and require no permit to operate. Personal Use Airports are facilities that serve only a single owner and, on occasion, visiting flights. Airports serving only agricultural uses are exempt from permits even though they may have high levels of aircraft operations (some in excess of 10,000 operations annually). Agricultural airports with high activity levels are depicted on Figure 4.13-1 of this report.

4.15 TRANSPORTATION PROJECTS IN ADJACENT JURISDICTIONS

A major regional improvement plan affecting Sutter County is the proposed improvement of the State Route 70 corridor to freeway standards. This plan is part of SACOG's 1992 Regional Transportation Plan (RTP) and would include a connecting roadway between Highway 99 in Sutter County and Highway 70 in Yuba County.

The 1995 Major Investment Study (MIS) prepared by Caltrans is intended to commence implementation of the State Route 70 and 99 Corridor Study. Within the MIS are several projects within Yuba County to improve traffic conditions on SR 70 around Marysville.

4.16 FINDINGS

- Sutter County is served by Highway 99 from Butte County in the north to Sacramento County in the south which includes a five mile section of freeway north of Yuba City.
- Sutter County is bordered by major rivers which limit roadway connections and alignments. The Sutter Bypass and various railroad alignments also restrict roadway connections within the County as well as access to the surrounding region.
- Regional travel north-south through Sutter County is limited to State Routes 70, 99 and 113. East-west travel is confined to State Route 20. A system of County roads with varying capacities interconnect this regional system.

- Sutter County has identified Level of Service (LOS) "D" as the minimum acceptable standard. There are no roadways within Sutter County that are operating beyond capacity. Numerous segments of State Route 99 have been identified as operating at or near capacity.
- The primary regional improvement plan involving Sutter County is the proposed improvement of the State Route 70 corridor to freeway standards to connect Sacramento and Chico. The construction of a third bridge connecting Yuba City and Marysville is another regional improvement project of high priority.
- Highway 99 functions as the main north/south corridor through Sutter County. This roadway is of critical importance since it accommodates large volumes of truck traffic and also connects Sutter County, Butte County and Chico to the Sacramento Metropolitan Area.
- According to projected travel demands, numerous State Routes and County roadways will exceed LOS "D" and will exceed design capacity by the year 2015. These identified roadways and intersections will require specific improvements in order to maintain the LOS at an acceptable level.
- Sutter County is currently served by the Yuba-Sutter Transit fixed route transit service that provides broad local coverage as well as commuter service to Sacramento. There is also a local demand responsive service for elderly and disabled residents.
- Sutter County currently has two railroad lines crossing portions of the County that can provide transport of agricultural goods and other materials. Limited passenger service is currently available in Marysville on the Southern Pacific line, however, this line is being proposed for commuter service in the future. No new rail lines are planned and several have been abandoned in the past.
- Air transportation is provided to the public by the Sutter County Airport. There are several small private airports that serve agricultural purposes and private uses. Regional air transportation services are provided by the Sacramento International Airport in Sacramento County.
- There is an identified corridor for State Route 99 that includes a City of Live Oak bypass.
- There are a number of proposed improvements to the regional travel system that will require additional right-of-way. Right-of-way acquisition costs can be reduced by preserving these right-of-ways from up-zoning and development.
- It is in the best interest of Sutter County that all local jurisdictions and transportation agencies work together on an ongoing basis to address regional transportation issues.
- Existing bikeway facilities within Sutter County are limited. Full implementation of the Yuba-Sutter Bikeway Master Plan could result in the addition of 210.10 miles (338.10 kilometers) of bikeway facilities within Sutter County.

4.17 PERSONS CONSULTED

Barrett, Bob, Director. Public Works Department

Carhall, Sylvia. February 28, 1996, Placer County Planning Department, personal communication

Helman, Rick. February 28, 1996, Yuba County Planning Department, personal communication

Langford, Gina. March 4, 1996, Placer County Planning Department, personal communication

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McAdam, Celia. Butte County Association of Governments (BCAG)

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CHAPTER 5

PUBLIC FACILITIES

5.1 INTRODUCTION

This chapter describes private and public infrastructure in Sutter County for the following facilities:

- public water supply (community water systems)
- well supply (individual systems)
- public wastewater systems (community systems)
- on-site wastewater systems (individual systems)
- drainage and flood control systems
- solid waste management systems

For each of the principal public facilities, the chapter describes the facility in terms of location, size, principal system components, ability to meet existing demand, ability to comply with regulatory permits, regulations and requirements, excess capacity or deficiency, expansion potential, and overall system capability including identification of limitations to growth.

5.2 COMMUNITY WATER SYSTEMS

This section describes the existing conditions of public water systems throughout Sutter County and assesses their ability to meet existing and future demands. Discussions are directed toward:

- 1) describing the purveyors in an overview
- 2) identifying the water system type
- 3) describing major water system components
- 4) discussing recent production capacities
- 5) outlining treatment practices
- 6) identifying system deficiencies and limitations
- 7) identifying existing planned, proposed or required improvements

OVERVIEW OF EXISTING PUBLIC WATER SYSTEMS

This section reviews the four public water systems in Sutter County that are classified as large water systems (200 connections or more), as defined by the water code. They are as follows:

The City of Yuba City
The City of Live Oak

Hillcrest Water Company
Sutter Community Services District

In addition to the large water systems, there are over 100 small systems that provide domestic water to individual projects and small outlying communities. For the purpose of this report these systems were not considered to be viable sources of domestic water for future urban development.

Table 5.2-1 summarizes the four systems reviewed for this report, including descriptions of the planned, proposed, or required improvements for each of the systems.

TABLE 5.2-1
PLANNED PUBLIC WATER SYSTEM IMPROVEMENTS

Water System	Planned Proposed or Required Improvement
City of Yuba City	Upgrade existing filters and add additional filters; upgrade sedimentation tanks; add emergency power system; add a fluoride feeding system; add and upgrade miscellaneous plant operation systems; and plant expansion.
Live Oak	No planned improvements.
Sutter CSD	Add connections, provide additional storage capacity.
Hillcrest	No planned improvements.

Of the four systems reviewed, only the City of Yuba City relies on surface water as the primary source of water for their system. The other three water purveyors rely solely on groundwater. These four systems served over 45,000 County residents and delivered over 4,610.6 million gallons of water to residential, commercial, and industrial users in 1992. A total of 11.115 million gallons of storage capacity is currently available within the water systems and chlorination is the primary method of disinfection for both groundwater and surface water systems. Table 5.2-2 notes the water sources and capacities for the four primary public water systems in Sutter County.

TABLE 5.2-2
WATER SYSTEM SUMMARY SUTTER COUNTY

Water Purveyor	Population Served (1992)	1992 Delivery (mil. gal.)	Sources of Water	Treatment Practices and Capacities	Storage Available
City of Yuba City	30,200	3,196.1	Feather River and 4 back up wells	Full Treatment, 15.0 mgd	9.25 mil. gal.
City of Live Oak	4,750	427.2	5 Wells	Chlorination , 6.4 mgd	25,000 gal.
Sutter CSD	3,600*	182	3 wells	Chlorination, 3.0 mgd	750,000 gal.
Hillcrest Water Company	10,056	987.3	14 wells	Chlorination, 3.88 mgd	1.065 mil. gal.

* Sutter CSD estimates reflect usage for July 1, 1994 through June 30, 1995.

PLANNED, PROPOSED OR REQUIRED IMPROVEMENTS

Improvements to public water systems in Sutter County can be made in response to regulatory mandate, user needs and operational requirements. Community growth is, however, the primary driving force behind major water system improvements and upgrades. Improvements might include the construction of distribution lines, development of new raw water sources, installation of new pump stations or the construction of new treatment and storage facilities. Upgrades to existing systems include the replacement and/or repair of system components to correct identified or potential problems.

COORDINATION WITH LOCAL WATER PROVIDERS

Senate Bill 901 (SB 901), enacted in October of 1995, requires that the conservation element of the general plan be developed in coordination with water agencies that have developed, served, controlled, or conserved water for any purpose for the county or city for which the plan is prepared.

Additionally, SB 901 requires cities and counties to coordinate with affected local water agencies when considering development proposals that require the preparation of an environmental impact report. This coordination includes identifying the water systems and sources of water to serve the proposed development. Projects which exceed the limits described in Table 5.2-3 are subject to the requirements of this legislation.

TABLE 5.2-3

SENATE BILL 901 THRESHOLDS

Type of Development	Persons Employed	Size
Residential	N/A	500 Homes
Shopping Center	1,000	500,000 Sq. Ft. Floor Space
Commercial Office	1,000	250,000 Sq. Ft. Floor Space
Hotel or Motel	N/A	500 Rooms
Industrial Park	1,000	40 Acres/650,000 Sq. Ft. Floor Space
Mixed Use Development	N/A	Equivalent Water Demand of 500 Homes

The requirements discussed within this section apply to coordination with “public water systems”. For purposes of complying with SB 901 legislation, public water systems are defined as “a system for the provision of piped water to the public for human consumption that has 3,000 or more service connections”.

The provisions of SB 901 have limited impact upon the Sutter County Comprehensive General Plan Revision since no major new development is proposed within the service area of an existing water agency with more than 3,000 service connections. However, future specific development proposals requiring environmental impact reports will be subject to requirements for identifying the source of water and the water service provider. Additionally, the County is required to request the public water system make an assessment of the capacity to meet the water use demands of the proposed development, and the water provider is required to present such an assessment within thirty days of request from the County.

5.3 GROUNDWATER AND WELL USE

HYDROGEOLOGY

Sutter County is located in the upper one third of the Central Valley, known as the Sacramento Valley. The Sacramento Valley drains south through the Sacramento River to its confluence with the San Joaquin River, then west through San Francisco Bay to the Pacific Ocean. Sutter County contains all four of the Geomorphic units found in the Sacramento Valley. These include:

1. Dissected Uplands: Dissected uplands are low hills and rolling topography that are comprised of alluvium (sand, silt, and mud). These deposits surround and form the base of the Sutter Buttes.
2. Low Alluvial Plains and Fans: Low Alluvial Plains and Fans are generally flat to gently undulant and are underlain by older alluvium consisting of silt, sand, gravel, and clay. These deposits originated in the Sierra Nevada and Cascade ranges and were transported by rivers and streams from these mountain ranges. These deposits make up a major portion of the County, and are found generally east of the Sutter Buttes.
3. Floodplain Deposits and Channels: The major floodplain deposits and channels lie along the Sacramento and Feather Rivers which comprise major portions of the County boundaries. These deposits are composed primarily of silt, gravel and small amounts of clay. This material was deposited along the river and in low lying areas during periods of flooding.
4. Overflow Lands: Overflow lands, also known as flood basins, are low, poorly drained areas that lie between the low alluvial plains and the natural levees of the Sacramento River. These areas are comprised primarily of clays and silt.

GROUNDWATER STORAGE AND RECHARGE

Groundwater is generally classified in two categories. Confined groundwater consists of deeper groundwater aquifers which are separated from the surface by some impermeable layer. In this condition, water is under greater than atmospheric pressure. Unconfined groundwater consists of seasonal or shallow groundwater which is found in sufficiently porous material to permit contact with the atmosphere.

Both groundwater conditions occur throughout Sutter County. Generally unconfined waters are found in alluvial fans, flood plains and stream channel deposits, while confined waters are found at greater depths generally separated by impervious clay layers. Figure 5.3-1 depicts the areas of the County that are subject to shallow groundwater conditions and seasonal flooding during the winter months.

Well yields in the County generally increase toward the rivers which border the County due to large deposits of coarse-grained alluvial deposits and flood plain deposits. However, other variables to well production include pump size, well construction, and the amount of groundwater replenishment. As shown on Figure 5.3-2, well yields are moderately high to high throughout the County.

Replenishment of groundwater occurs through percolation of stream flows, precipitation, and through the application of irrigation water. According to the Department of Water Resources, stream percolation and deep percolation of rain water are the principal sources of groundwater recharge in the Sacramento Valley.

GROUNDWATER STORAGE

In 1992 the California Department of Water Resources updated the California Water Plan. The plan contains estimates of groundwater storage by county, for the entire state. The estimates are for the storage potential up to a depth of 200 feet.

For Sutter County, the state has estimated a useable storage potential of five million acre feet. This storage potential should not be equated to usable water. As discussed later in this chapter, there are a variety of water quality issues which affect the ultimate useability of groundwater in the County.

WELL USAGE WITHIN THE COUNTY

According to the 1990 census there are 8,380 households which obtain their domestic water from individual wells. Table 5.3-1 shows the general distribution of domestic wells throughout the County.

In addition to the domestic wells there are other wells throughout the County that support a variety of uses including: agriculture, industrial, fire protection and monitoring purposes. Unfortunately, complete information regarding the total number, production and type of wells located throughout the County is not readily available. However, according to the Department of Water Resources, annual groundwater withdrawal is estimated to be 295,000 acre feet per year. This is equivalent to 96 billion gallons.

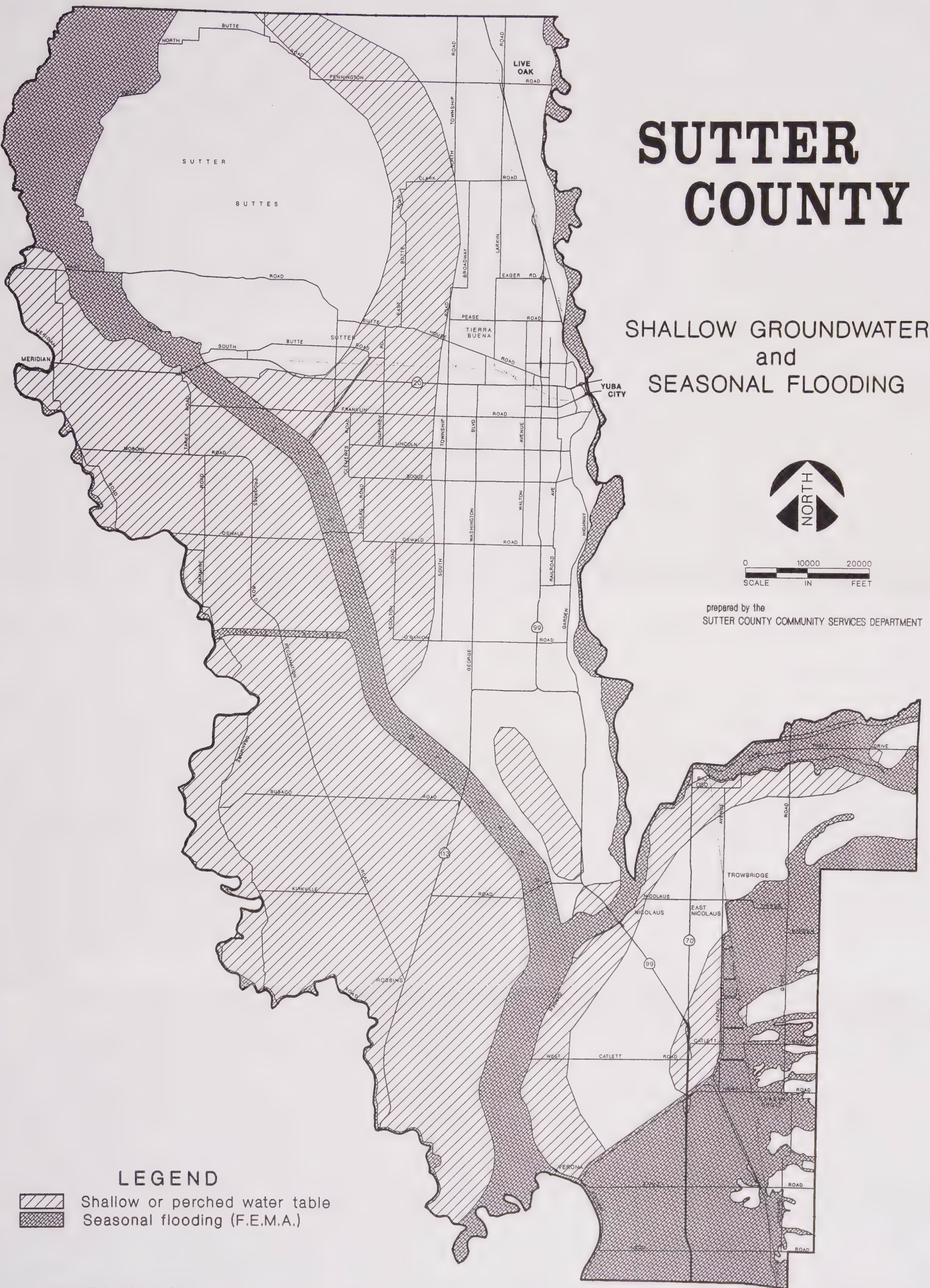
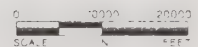


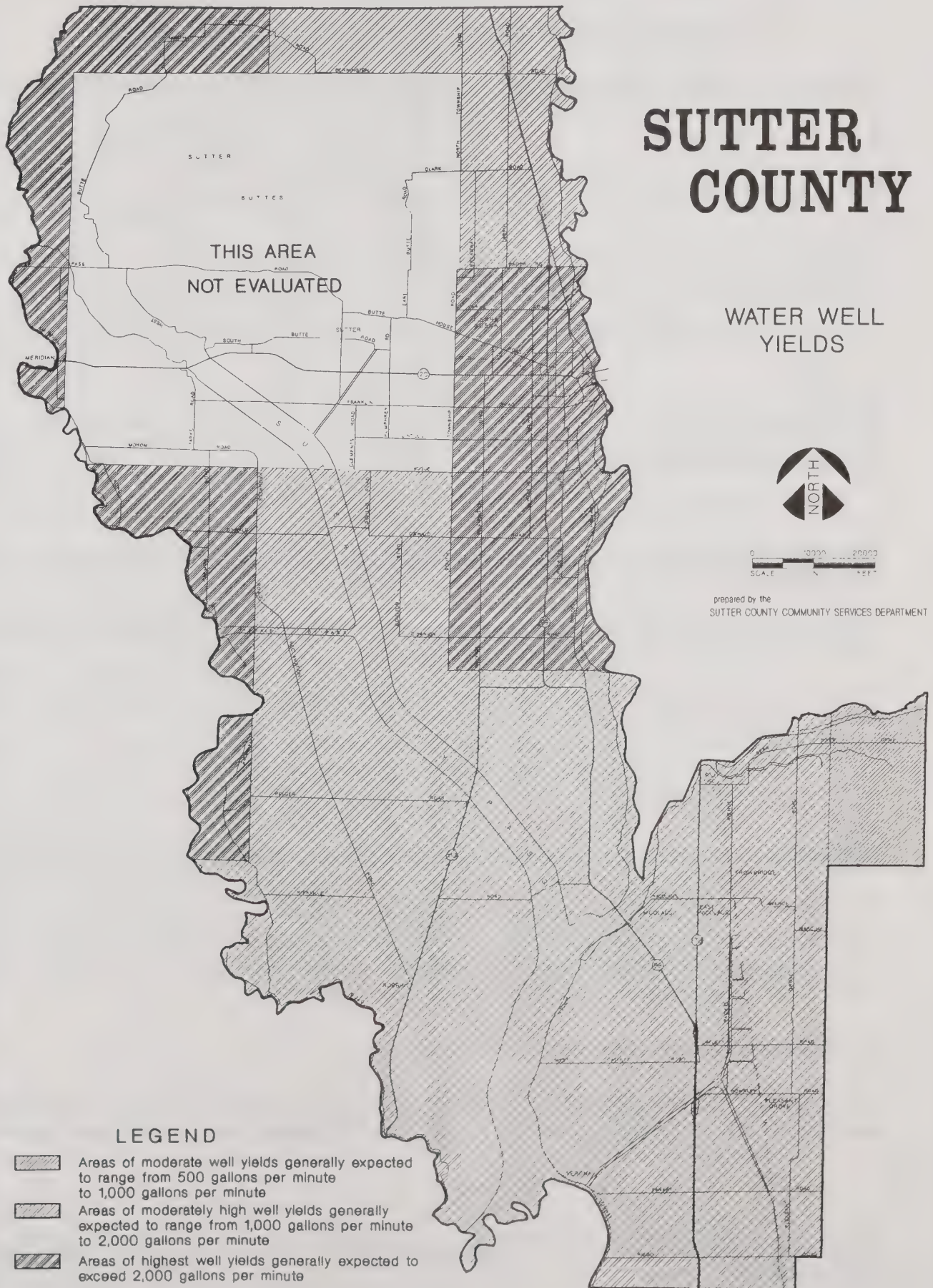
Figure 5.3-1
Shallow Groundwater
and Seasonal Flooding

SUTTER COUNTY




WATER WELL YIELDS



prepared by the
SUTTER COUNTY COMMUNITY SERVICES DEPARTMENT



LEGEND

-  Areas of moderate well yields generally expected to range from 500 gallons per minute to 1,000 gallons per minute
-  Areas of moderately high well yields generally expected to range from 1,000 gallons per minute to 2,000 gallons per minute
-  Areas of highest well yields generally expected to exceed 2,000 gallons per minute

Source - California Department of Water Resources, "Evaluation of Ground Water Resources, Sacramento Valley", August 1978

Figure 5.3-2
Water Well Yields

TABLE 5.3-1

SOURCES OF DOMESTIC WATER IN SUTTER COUNTY

Location	Households Served by Public System or Private Company	Wells		Other
		Drilled	Dug	
Yuba City Urban Area	14,157	3,749	164	18
(Yuba City)	10,898	143	15	12
¹ (Tierra Buena)	325	681	27	0
(Remaining YCUA Unincorp.)	3,259	3,606	149	6
Live Oak	1,336	54	8	0
² Community of Sutter	38	826	52	0
Remaining Unincorporated	253	3,552	134	19
(Total Unincorporated)	3,512	7,777	383	25
Sutter County Total	15,746	7,974	406	37

Source: 1990 Census

¹ The data for the "Tierra Buena area is included within the "YCUA Unincorp." figure. The data was derived from the 1990 Census' [*Census Designated Place (CDP) for Tierra Buena*].

² The data for the "Community of Sutter" area is included within the "Remaining Unincorp." figure. The data was derived from the 1990 Census' [*Census Designated Place (CDP) for the Community of Sutter*].

GROUNDWATER QUALITY

Data collection is currently in progress by the State Department of Water Resources and by the Environmental Health Program in the Community Services Department that will provide more information about the quality of well water in the County. Preliminary data shows that some wells drilled to various depths contain chemical elements and compounds in amounts that exceed drinking water quality safety and aesthetic standards. Additional groundwater studies are necessary to better define areas of contamination and the sources of the contaminants.

Water Quality Maps for Chemicals

Five water quality maps (Figures 5.3-3 through 5.3-7) give a general indication of amounts and locations of various chemicals of interest in well water. Chemicals noted on the maps include:

- Arsenic, chloride, iron and manganese, which are natural constituents of some rocks and soil. Arsenic was also a constituent of some pesticides used many years ago.
- Bentazon and DBCP are pesticides. The data used was derived from a single testing series on a small number of wells from 1983 and may or may not be indicative of current conditions.
- Nitrate is applied as a fertilizer and is also produced from on-site sewage disposal systems.

The MCL to which the map legends refer is the Maximum Contaminant Level established by US-EPA and State Department of Health Services for drinking water. The primary MCL reflects a health standard, whereas the secondary MCL reflects an aesthetic and taste standard for the average healthy person.

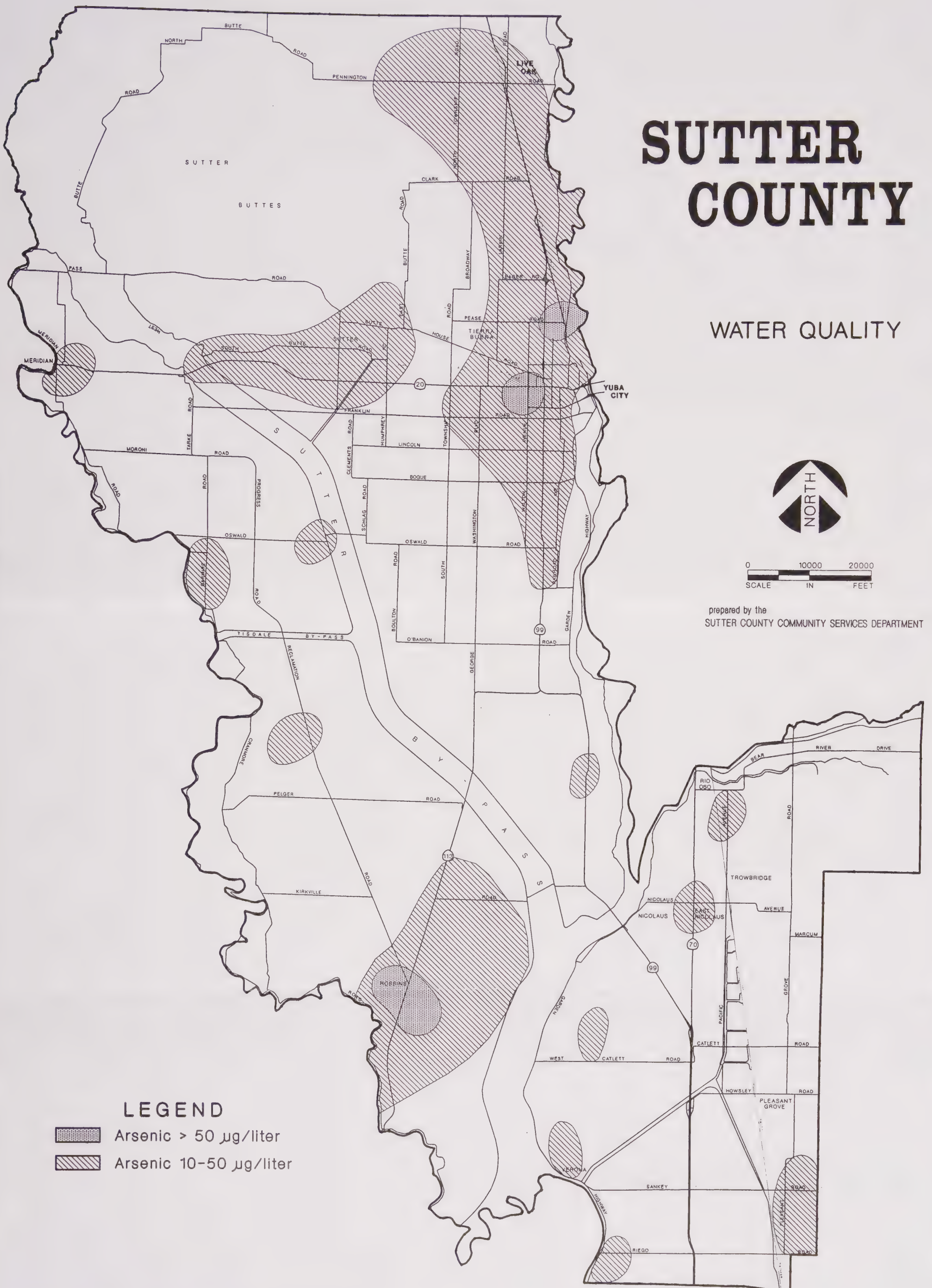
Of the chemicals shown on the following water quality maps, nitrate has the most documented adverse health effects: when water with high nitrate is given to infants, the so-called "blue-baby" syndrome can be a fatal result. Nitrate may also react in the intestine of people of any age, to form carcinogenic nitrosamine compounds, and present a cancer hazard.

After analyzing well samples from the Tierra Buena area in 1988 and 1991, Department of Health Services Office of Drinking Water concluded that "...the high nitrate results appear to be caused by wastewater discharge to septic tank leach field systems...". Numerous high nitrate wells have also been reported in the community of Sutter. As a result, the community has established the Sutter Community Services District with three new wells and a water distribution system, in order to deliver water that meets public water system standards.

When a well is drilled into an aquifer that has naturally high concentrations of objectionable or hazardous elements, the water may be treated after it is pumped to the surface in order to reduce the concentration of those elements. The procedure can be expensive, depending on the element. An emerging problem is the downward movement of nitrate contamination. The investigation in progress may help to define the depths and locations at which water may be found that has neither high levels of nitrate nor arsenic.

SUTTER COUNTY

WATER QUALITY



LEGEND

- Arsenic > 50 µg/liter
- Arsenic 10-50 µg/liter

Note: Locations are approximate and based upon wells that have been tested. Concentrations vary depending on depth of well tested. Not all wells in a designated areas have been tested.

Figure 5.3-3
Ground Water Quality



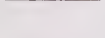
SUTTER COUNTY

WATER QUALITY



prepared by the
SUTTER COUNTY COMMUNITY SERVICES DEPARTMENT

LEGEND

-  Bentazon
-  Chloride > 250 mg/liter
(sec. MCL = 250 µg/liter)
-  DBCP

Note: Locations are approximate and based upon wells that have been tested. Concentrations vary depending on depth of well tested. Not all wells in a designated areas have been tested.

Figure 5.3-4
Ground Water Quality

SUTTER COUNTY


WATER QUALITY NITRATE



0 10000 20000
SCALE IN FEET

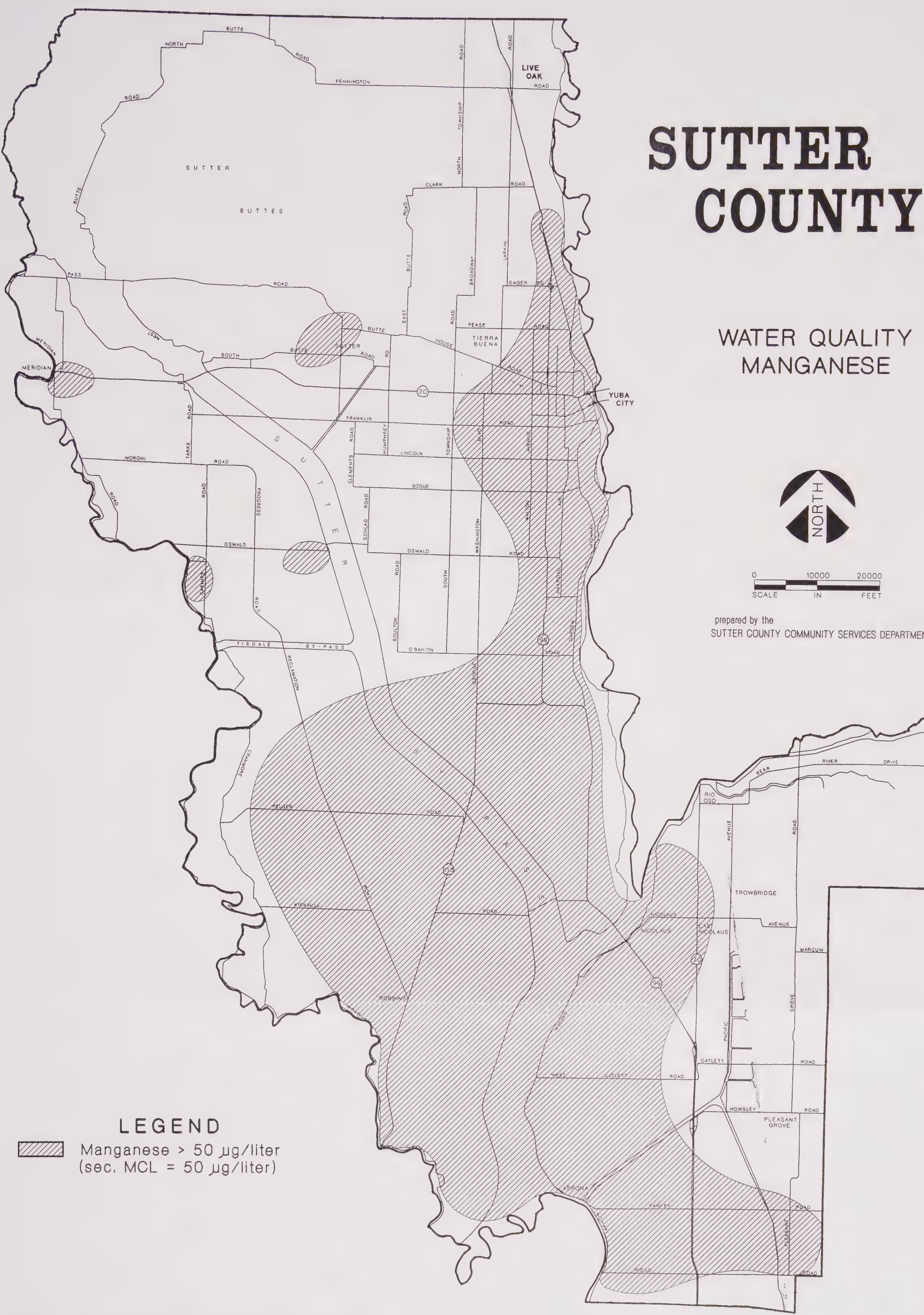
prepared by the
SUTTER COUNTY COMMUNITY SERVICES DEPARTMENT

LEGEND

 Nitrate > 45 mg/liter
(pri. MCL = 45 mg/liter)

Note: Locations are approximate and based upon wells that have been tested. Concentrations vary depending on depth of well tested. Not all wells in a designated areas have been tested.

Figure 5.3-5
Ground Water Quality - Nitrate



Note: Locations are approximate and based upon wells that have been tested. Concentrations vary depending on depth of well tested. Not all wells in a designated areas have been tested.

Figure 5.3-6
Ground Water Quality - Manganese

SUTTER COUNTY

WATER QUALITY IRON



prepared by the
SUTTER COUNTY COMMUNITY SERVICES DEPARTMENT

LEGEND

 Iron > 300 µg/liter
(sec. MCL = 300 µg/liter)

Note: Locations are approximate and based upon wells that have been tested. Concentrations vary depending on depth of well tested. Not all wells in a designated areas have been tested.

Figure 5.3-7
Ground Water Quality - Iron

Bacteria and Viruses

Bacteria and viruses may occur in well water as contaminants. Testing for viruses is a lengthy and expensive procedure that is generally considered appropriate only when investigating a particular disease outbreak. Testing for coliform bacteria is commonly done to provide an indication of contamination of potentially harmful bacteria. When coliform bacteria, which may be normal inhabitants of soil, are found in a well, additional tests for fecal coliform bacteria may be conducted. Fecal bacteria contamination could originate from human or animal waste.

Groundwater Protection

Groundwater contamination is a preventable condition. Table 5.3-5 presents measures that can be taken to provide more protection for well water than now exists. No single strategy will be adequate; groundwater protection is multifaceted and will need a combination of strategies to accomplish. Three reports were issued recently by the Environmental Health Program of the Community Services Department that present groundwater quality data and methods to reduce further contamination from septic systems and individual wells. These reports are included in the bibliography at the end of this chapter. Comprehensive groundwater studies based upon the quality data now being collected at the local level may be appropriate in the future.

As part of its program to protect water quality, the Central Valley Regional Water Quality Control Board (CVRWQCB) is working on a revision of its Basin Plan, which is expected to establish new regulations for a) minimum lot sizes when sewage disposal will be on site and b) other aspects of septic system design and installation. Basin Plan revision may also deal with pesticide use, agricultural commodities, storm water, agricultural drainage, etc. which would affect water quality.

TABLE 5.3-2

STRATEGIES FOR ADDRESSING SOME GROUNDWATER CONTAMINATION PROBLEMS

MITIGATION	PROBLEM			
	Nitrate in Upper Aquifer	Nitrate in Lower Aquifer	Coliform Bacteria in Wells	Other Contam- inants
1. Fewer septic systems per acre	X			
2. Best management practices for agricultural chemicals	X			X
3. Maximize microbial and plant utilization of nitrate in design of septic systems	X			
4. Community sewage treatment plants	X	X	X	
5. Adequate annular seals on wells	X	X	X	X
6. Adequate separation of wells from septic systems	X		X	
7. Destroy substandard wells by adequate method	X	X	X	X
8. Construct wells to prevent contamination between aquifers		X		X
9. Test all wells for suspected contaminants and remediate where indicated	X	X	X	X

Sutter County has excellent groundwater storage and recharge characteristics. Groundwater quality ranges from poor to very good . Groundwater quality is expected to deteriorate unless additional steps are taken to decrease the amounts of contaminants that are applied to and in the ground, and to decrease the ability of wells and other excavations to transmit contaminants from upper regions of the ground to lower regions that provide well water.

In addition to contaminants resulting from human activities, groundwater resources in portions of the County have naturally occurring levels of minerals which present some concerns. Such conditions require that, in some areas, farmers must use a combination of ground and surface water to avoid accumulation of minerals which can be detrimental to agricultural production. Additionally, use of surface water helps to protect both quantity and quality of groundwater resources by avoiding overuse of the groundwater and by infusing aquifers with the higher quality of surface water.

Sutter County's historic role as an agricultural producer requires that the County ensure water availability in the future. Increasing water demand to meet urban and environmental needs statewide has created threats to local water rights. It is imperative to Sutter County's long-term economic viability that adequate water supplies be available in the future. Such availability can be ensured only by protecting existing local water rights by developing new supplies to meet the increasing water demands of the future and by discouraging or prohibiting transfer and export sales..

5.4 PUBLIC WASTEWATER SYSTEMS

Community wastewater systems in Sutter County vary greatly in size, from small systems serving a limited number of homes to a large incorporated city. Community wastewater systems are an important factor to new development within the County since every system is designed and permitted to operate under a well-defined treatment capacity and final effluent quality limitations.

This section focuses on the existing conditions of the community wastewater systems in Sutter County.

OVERVIEW OF EXISTING WASTEWATER SYSTEMS

The following four community wastewater systems were identified for review in this report.

- City of Yuba City Wastewater Facility
- City of Live Oak Wastewater Facility
- Tierra Buena CSD Wastewater Facility
- Community of Robbins Wastewater Facility (construction pending)

Table 5.4-1 shows the number of housing units which rely on public wastewater treatment systems in the County. Overall, the distribution of public sewer systems in the County is slightly higher than the use of individual on-site sewage disposal systems. However, in the unincorporated areas of the County, the use of individual on-site systems is the primary means of sewage disposal.

TABLE 5.4-1

**METHOD OF WASTEWATER TREATMENT BY DWELLING
PUBLIC SEWER VERSUS INDIVIDUAL ON-SITE SEWAGE DISPOSAL SYSTEMS**

	1980			1990		
Comm.	Total Housing Units	Housing Units With PS	Housing units with on-site SDS	Total Housing Units	Housing Units With PS	Housing Units with on-site SDS
Sutter Co.	20,425	11,186	9,242	24,163	13,389	10,774
Live Oak*	1,109	1,112	0	1,428	1,358	70
Yuba City	8,479	8,359	120	11,068	10,831	237
Uninc.	10,837	1,715	9,122	11,667	1,200	10,467

(source: 1980/1990 U.S. Census)

* The number of housing units with public sewer exceeds the total number of housing units due to Census sample statistics methodology.

There are two major classifications of public wastewater treatment processes currently in use in Sutter County. These include activated sludge and aerated pond. In addition there is a hybrid of these systems that is also used. This system is a Septic Tank Effluent Pump System (STEP), connected to a community disposal field. Table 5.4-2 shows the types of treatment processes used by the four community wastewater systems in Sutter County. Of the four systems reviewed, only two are permitted by the RWQCB to discharge to surface watercourses. The remaining two systems rely on a combination of evaporation and percolation methods to dispose of treated wastewater.

The maximum permitted wastewater flows from the four systems total 8,251,600 gallons per day (average 30-day dry weather flow). Between November 1 through May 14, approximately 99 percent, or 8,200,000 gallons per day is permitted to be discharged to surface watercourses for final disposal.

Between May 15 through October 31, the City of Yuba City is prohibited from discharging treated wastewater to the Feather River and utilizes the evaporation ponds for final disposal of treated wastewater.

TABLE 5.4-2

COMMUNITY WASTEWATER TREATMENT METHODS BY COMMUNITY

Community	Treatment Method	Treatment Level	Disposal Method	Permitted Capacity (mgd)	Surplus Capacity
Yuba City	Oxygen Activated Sludge	30 BOD 30 TSS 45 BOD 45 TSS	Surface Discharge & Evaporation Pond	7.0 mgd	2.5 mgd
Live Oak	Aeration/Oxidation Ponds	25 BOD 35 TSS	Surface Discharge	1.2	.6
Tierra Buena CSD	Septic Tank/Sand Filter	10 BOD .5 TSS	Tree Irrigation	0.0216	0
Robbins*	Septic Tank/Sand filter	N.A.**	Wetlands	0.03	0

* Construction to begin in the summer of 1996

** Biological Oxygen Demand (BOD) and Total Suspended Solids (TSS) standards were not made a condition of this permit because of the treatment process utilized.

PLANNED, PROPOSED AND REQUIRED IMPROVEMENTS

The only currently planned wastewater system is a new facility for the community of Robbins. Construction had been anticipated for 1994. However, estimated construction costs required that the project be redesigned and construction is now expected for 1996.

Community wastewater system improvements are a consideration for regulatory agencies as well as system owners and operators. Improvements can be based on needs such as improvement of effluent quality from the treatment plant, increasing treatment plant capacity to accommodate community changes and growth, reducing infiltration/inflow (I&I) contribution to collection systems, changes or improvements to disposal systems and responding to changes in receiving water quality goals of basin planning guidelines. Community growth is the primary force for most community wastewater system improvements (Table 5.4-3).

TABLE 5.4-3**PLANNED COMMUNITY WASTEWATER SYSTEM IMPROVEMENTS**

Community	Planned, Required or Proposed Improvements
Yuba City	Replace sewage discharge piping; Provide odor control at primary clarifier, sludge handling, lift stations and other plant facilities; Replace and upgrade lift stations; Add a third digester; Emergency storage and equalization basin; Raw sewage headwork modifications; Replace or upgrade miscellaneous plant systems; Plant expansion.
Live Oak	No Improvements Planned
Tierra Buena	No Improvements Planned
Robbins	Construction of system to begin in summer of 1996.

5.5 ON-SITE SEWAGE SYSTEMS**ON-SITE SEWAGE DISPOSAL**

The cities of Yuba City and Live Oak operate sewage treatment plants. Except for some subdivisions close to Yuba City that are served by the Yuba City sewage treatment plant or the Tierra Buena CSD, most parcels in the unincorporated portions of the County use on-site sewage disposal systems, which are also called septic systems. Because many of the older systems were installed before the County Health Department kept records, the total number of septic systems in the County is not known.

On-site Sewage Systems

On-site sewage systems are required to be installed in accordance with Federal, State and County mandated codes and regulations. Sutter County has a waste discharge agreement with the Central Valley Regional Water Quality Control Board (CVRWQCB) under which the Community Services Department may issue permits for on-site sewage disposal systems as long as the requirements of the CVRWQCB, primarily delineated in the Area Basin Plan, are followed.

New on-site sewage disposal systems, extensive repairs or alterations, and additions or replacements of existing sewage disposal systems require design and construction approval by the Community Services Department. These construction projects are inspected and permitted by the Community Services Department on an individual basis.

On-site sewage disposal systems can be considered as "standard" or "alternative" in design. A typical or "standard" on-site sewage disposal system consists of a septic tank, generally placed just outside the residence or commercial building being served, and a gravity-fed network of perforated pipelines placed in the soils of the area chosen for the leachfield (disposal field). Of primary importance to proper operation of on-site sewage systems is the ability of the soils containing the leachfield to offer proper treatment of the septic tank effluent prior to contact with groundwater. Three to five feet of permeable, oxygenated and unsaturated soil below the disposal trench is required to adequately treat the effluent before it encounters groundwater.

Solids, greases, and scum are by design trapped in the septic tank and removed (typically every few years) from the tank by a septage hauler using a pumper truck. This septage must be hauled to a disposal site where further treatment precedes ultimate disposal.

Handling of septage has become a financial and ecological problem for many California counties. Final septage disposal can be to land by tilling or spraying, evaporation of liquid portions to increase the solids content with burial of the solids in permitted facilities (usually landfills), further treatment at an existing community wastewater treatment facility or other sound technical and permitted means. In Sutter County the majority of septage is treated at the City of Yuba City sewage treatment plant. The long range ability of the Yuba City plant to continue accepting septage is unknown.

In July, 1993, the Environmental Health Program issued "Interim Standards for Design and Evaluation of Special Design, Alternative, and Modified On-site Sewage Disposal Systems", to be used until the CVRWQCB issues a revision of its Basin Plan. Where there are difficult site conditions, an alternative to a conventional septic system may now be allowed on existing parcels, if certain requirements are met.

Pressure-Distribution, Wisconsin Mound, Wisconsin At-Grade, Sand Filter-Conventional, Sand Filter-Pressure Distribution, and Sand Filter-At-Grade may all be considered. Some sites will still not be suitable for an on-site sewage disposal system under permit from the Environmental Health Program and will require review by the CVRWQCB. Due to restrictive site conditions, some parcels will not be capable of being developed with any on-site sewage disposal system.

Site Conditions and On-Site Sewage Disposal Constraints

The flat valley floor that occupies most of Sutter County often has high groundwater and soils with a high clay content. Some areas also have layers of varying textures that are commonly called hardpan. These three conditions present problems for on-site sewage disposal:

- High groundwater can prevent the microorganisms in the soil from effectively treating the sewage. Partially treated sewage could then contaminate the groundwater or nearby surface water.
- Soils with a high clay content can retard the percolation of liquid to such an extent that sewage surfaces on the ground.

- Hardpans retard percolation. They also prevent effective treatment because they are poor environments for the beneficial soil microorganisms.

Septic System Surface Failures

Septic systems can result in sewage ponding on the ground surface from a variety of causes:

- Distribution or leach lines crushed from vehicles being driven over them;
- Leach lines blocked following infiltration by roots of trees or shrubs;
- Excessive rain or irrigation;
- Excessive water entering system from building drains;
- Harmful chemicals entering system, resulting in a poisoning of beneficial soil microorganism;
- Insufficient oxygen reaching the soil, resulting in the formation of clogging mats by anaerobic bacteria;
- Other reasons.

The County has a record of surface failure of leach lines in more than 400 septic systems in the County. When leach lines fail, attempts are made to issue a permit for replacement leach lines to be installed. Unfortunately, sometimes the parcel does not have enough land to be able to accommodate enough leach lines for a full repair.

Septic System Subsurface Failures

A second way in which septic systems can fail is not usually recognized as a failure: the septic system can contaminate the groundwater by subsurface contact. Septic tank leachate is the most frequently reported cause of groundwater contamination. Pathogenic bacteria, viruses and high nitrate concentrations have all been found in groundwater in other locations in the United States. All these forms of contamination have caused serious illness. No comprehensive study of these contaminants in Sutter County has been performed.

Many wells in the community of Sutter and the greater Yuba City areas are known to have been contaminated with nitrate at levels that are higher than the Maximum Contaminant Level of 45 milligrams per liter of drinking water, established by the State Department of Health Services and Federal EPA. A State Office of Drinking Water study concluded that septic systems appeared to be the cause of the high nitrate in the wells studied in the greater Yuba City area.

Septic systems can be designed and installed in a way that reduces the amount of nitrate and bacteria that enter the groundwater. In the past, many septic systems were installed without adequate attention being paid to the problem of groundwater contamination. Of particular concern are seepage pits and leaching line trenches that extend directly into water bearing stratas or to depths with limited oxygen available for microbial treatment of the effluent (3 feet is the current standard for conventional systems). Many subdivisions in the greater Yuba City area were built with deep-trench septic systems which potentially contribute to groundwater contamination.

Future Considerations

Permitting of septic systems involves issues of water contamination, growth and development.

- Where groundwater contamination is the major concern, septic system management districts could provide needed information and ensure proper maintenance of septic systems.
- Another way to retard, but not eliminate, contamination of the groundwater from septic systems, would be to reduce the density of septic systems in new development.
- In areas where the County wants development of an urban character to occur, community sewage treatment would allow greater density of buildings and population than with septic systems. The solid residuals and treated wastewater would require proper disposal.
- When the CVRWQCB issues its revised Basin Plan, there may be additional requirements that the County would have to meet for lawful treatment and disposal of the sewage that is produced within its boundaries.

5.6 DRAINAGE AND FLOOD CONTROL

This section focuses on those low lying portions of Sutter County subject to drainage problems and potential inundation from storm water runoff.

TOPOGRAPHY AND GEOGRAPHY

Sutter County is in the east-central part of the Sacramento Valley. The Sacramento Valley forms the northern half of the Central Valley, which is surrounded on all sides by mountains, except where the Sacramento and San Joaquin Rivers enter the San Francisco Bay.

Sutter County topography is a relatively flat alluvial plain with the exception of the Sutter Buttes and the surrounding rolling terrain. The eastern part of the County is an alluvial terrace with elevations of 35 to 80 feet. This terrace generally drains to the southwest into the lower Sutter and American Basins, which are at 10 to 40 feet elevation. Drainage generally is provided by ditches and pumping plants that elevate the water over the levees of the Sacramento River.

The Sacramento River provides drainage for all of Sutter County and the Sacramento Valley through a system of levees and bypasses completed in the 1920's. In winter and spring, floodwater from various rivers and drainageways is controlled by this system. The final outlet of the water is the Delta and San Francisco Bay.

The National Flood Insurance Act of 1968 has adopted a desired level of protection for development from flood water damage of the Intermediate Regional Flood (IRF), i.e. that flood which has an average frequency of occurrence on the order of once every 100 years, although the flood may occur in any given year.

PRECIPITATION

Precipitation occurs primarily between November and April when 88 percent of the average annual rainfall is received. Annual averages vary for the County from 17 to 21 inches. Annual rainfall increases across the area from the southwest to the northeast.

DRAINAGE AND FLOODING PROBLEM AREAS

Localized flooding from storm run-off occurs throughout the County with several areas of primary concern. Two major areas in the southeast portion of the County are subject to the IRF 100 year flood. The areas along Bear River Drive and along Pleasant Grove Road through South Sutter County have been identified by the National Flood Insurance Program as being in flood hazard areas. These areas have not been included in the FP (Flood Plain Combining) Zone District. A third area, the Butte Sink, in the northwestern part of the County is also subject to localized flooding. New development in this area, however, is required to establish a minimal degree of protection since the FP District is applied in the area.

Another area of particular concern is the community of Sutter. There has been considerable residential development in this area without the benefit of a drainage plan. Localized drainage problems exist and there is potential for more residential development to occur on existing lots that would further contribute to the problem. A master plan study for drainage system design and improvement should be undertaken in order to alleviate existing and future drainage problems.

The final issue that affects all properties located within the County relates to unregulated grading activities. Historically, the County has not been involved in regulating grading activities, either agricultural or construction related. This fact is evident in a number of areas where site specific drainage patterns have been altered for agricultural purposes or site development without the benefit of design controls that would have avoided the negative resultant effects such as overburdening of an existing drainage facility. Other problems that typically result from such modification to drainage patterns include alteration of existing natural drainage channels and the resulting effects that occur both upstream and downstream. It is important to avoid the contribution of additional run-off to adjacent properties. Such modifications can result in agricultural crops being negatively impacted or endangerment of existing structures.

FLOOD DAMAGE PREVENTION

The potential for major flooding in Sutter County is primarily a function of the integrity of the reservoir, levee and bypass systems currently protecting those areas subject to inundation. Historical flooding that has caused property damage and loss of life resulted from levee failure. In addition to the potential for flooding resulting from a levee break or overtopping of the levees, the threat of a dam break also exists. A break in any one of the following dams could cause flooding in Sutter County:

- Oroville Dam - Feather River
- New Bullards Bar Dam - Yuba River
- Camp Far West Dam - Bear River
- Lake Almanor Dam - Feather River
- Thermalito Afterbay Dam - Feather River
- Thermalito Forebay Dam - Feather River
- Shasta Dam - Sacramento River
- Whiskeytown Dam - Clear Creek (Sacramento River)
- Folsom Dam - American River
- Englebright Dam - Yuba River

Details regarding the storage capacity, construction type, etc. are provided in the Flood Hazards and Dam Safety section (Safety Chapter) of the General Plan Background Report.

LOCAL DAMS UNDER STATE JURISDICTION

Dams under State jurisdiction are artificial barriers, together with appurtenant works, which are 25 feet or more in height or have an impounding capacity of 50 acre feet or more. Any artificial barrier not in excess of 6 feet in height, regardless of storage capacity, or has storage capacity not in excess of 15 acre feet, regardless of height, is not considered jurisdictional.

There is one dam located within Sutter County that qualifies under the above described criteria. The Steidlmayer #3 dam was completed in 1961. This is an earthen dam 49 feet high, with a total storage capacity of 82 acre feet. It is located in the northwestern interior of the Sutter Buttes. Due to the remote location and size of this facility, failure of this dam would result in minimal potential property damage.

YUBA CITY URBAN AREA

The area of the County with the greatest potential to be impacted by drainage and flooding problems is the Yuba City Urban Area. The primary issue aside from dam or levee failure is storm water run-off from the urban area being directed away from the developed areas via existing drainage structures and improvements. As development continues to occur in the urban area, the increase in impervious surfaces will result in increased overall run-off at an accelerated rate. The drainage infrastructure must be designed to accommodate this increase in run-off.

The Yuba City Urban Area contains the following existing drainage facilities:

1. Gilsizer Slough
2. Live Oak Canal
3. City Systems (facilities within or serving Yuba City)
4. Local improvements (facilities within or serving improvement districts)

Gilsizer Slough

Gilsizer Slough is a natural drainage channel that historically has drained Yuba City and the area south of town. Areas tributary to Gilsizer Slough include all of Gilsizer County Drainage District, except for a small area of the City north of Colusa Highway which is pumped directly to the Feather River. Gilsizer Slough discharges to the State Drain which flows north to State Pumping Plant No.2 and then into the Sutter Bypass.

Live Oak Canal

Live Oak Canal historically has carried stormwater run-off from areas north of Pease Road, and the area that is now Tierra Buena County Drainage District. The majority of the area north of Pease Road is now drained by the State-owned East Interceptor Canal.

City Systems

Most of the Yuba City area north of Colusa Highway drains to a holding pond near the Sewage Treatment Plant east of Market Street. The water in the holding Pond is pumped over the levee and discharged into the Feather River. The Garden Highway/Bogue Road residential area is also pumped over the levee into the Feather River.

Local Improvements

In addition to the collection systems maintained by Yuba City, local improvements have also been constructed within a number of other drainage districts. These systems have varying capacities to carry runoff.

It should be noted that removing flood water from the urban environment does not completely resolve drainage issues. In some cases urban drainage canals are well maintained until outside of urban development, but lack of downstream channel maintenance sometimes creates problems for adjacent landowners. Also, flow capacity within the Sutter Bypass has limits, and in major flood events water can back-up within the County prior to discharge pumping into the Bypass and flood agricultural lands.

COUNTY-WIDE FLOOD PROTECTION

The principal method of flood protection is structural, consisting of reservoirs, levees and bypasses. As noted above, the reservoirs are all located outside the County. The primary method of flood protection provided in the County is via a system of levees or earthen embankments along the Sacramento and Feather Rivers that contain high river flows within these artificial channels. When the capacity of the levee system is exceeded, the bypass system accommodates the additional flows. A bypass is an auxiliary channel used to pass floodwater. Bypass systems are used in flood protection projects when the potential high flow is larger than the channel capacity. The bypass is usually leveed creating the additional capacity. This type of system can take the load off the primary levee system during critical peak flow periods. Bypass systems are needed only during major floods, and lands reserved for this purpose can be used for agriculture, wildlife management, recreation, or other compatible uses at other times.

As the Sacramento River flows southward from Shasta Dam, natural overflow areas and two fixed weirs, Moulton and Colusa, permit floodwater to escape from the river into the Butte Basin. This basin is a natural flowage area that has not been drained and developed as have similar basins to the west and south. Waters in the Butte Basin move into the upstream end of the Sutter Bypass. At Tisdale Weir, additional water can be diverted from the Sacramento River directly into the Sutter Bypass. The Feather River system, which drains the east side of the Sacramento Valley, enters the Bypass directly. The Sutter Bypass and the Sacramento River join just above the Fremont Weir. This weir divides the joint flow of the river-bypass system, limiting flow into the Sacramento River channel to its capacity and permitting the excess flow to cross the river and enter the Yolo Bypass. Near Sacramento, the Sacramento Weir provides the final escape route from the river to the Yolo Bypass.

The Sacramento River Flood Control System Evaluation prepared by the U.S. Army Corps of Engineers has identified deficiencies in the structural integrity of the levees along the Feather and Yuba Rivers, indicating that the level of flood protection provided by these levees is lower than previously thought. Without the remedial recommendations identified in this report, Sutter County is obliged to acknowledge the lower level of protection. This could be a significant constraint on planned growth in the study area. The area of Sutter County impacted extends from the Butte/Sutter County line along the Feather River west to the Sutter Bypass and south to their confluence (see Figure 5.6-1).

APPRAISAL

Significant drainage problems exist within the County. The Nolte Report identifies problem areas within the Yuba City Urban Area and recommends improvements. Little information exists for the remainder of the County. Empirical information from personal observations by staff of the Public Works Department is the primary source of information. A number of reclamation districts maintain canals that carry irrigation and storm water run-off, however, their primary responsibility is protection of water quality discharges by controlling releases according to farming chemical activity of herbicide and pesticide use. Issues of concern relate to 1) protection of those areas subject to the IRF and 2) local improvement programs for those areas subject to localized flooding from storm water run-off. This protection could come in the form of various improvement programs or restricted land use.

Among the most serious threats to the Yuba City Urban Area is flooding resulting from failure of levees along the Feather River. The U.S. Army Corps of Engineers has identified specific deficiencies within the Feather River levees and is proceeding with improvements. Sutter County established the West Feather River Levee Reconstruction Agency to raise funds to pay the local share for the improvements. A one-time fee was charged to approximately 20,000 parcels, including all of Yuba City and Live Oak, to generate needed funds. Proposed Feather River levee improvements will provide close to 100-year flood protection. Levee improvements are anticipated to begin in late 1997.

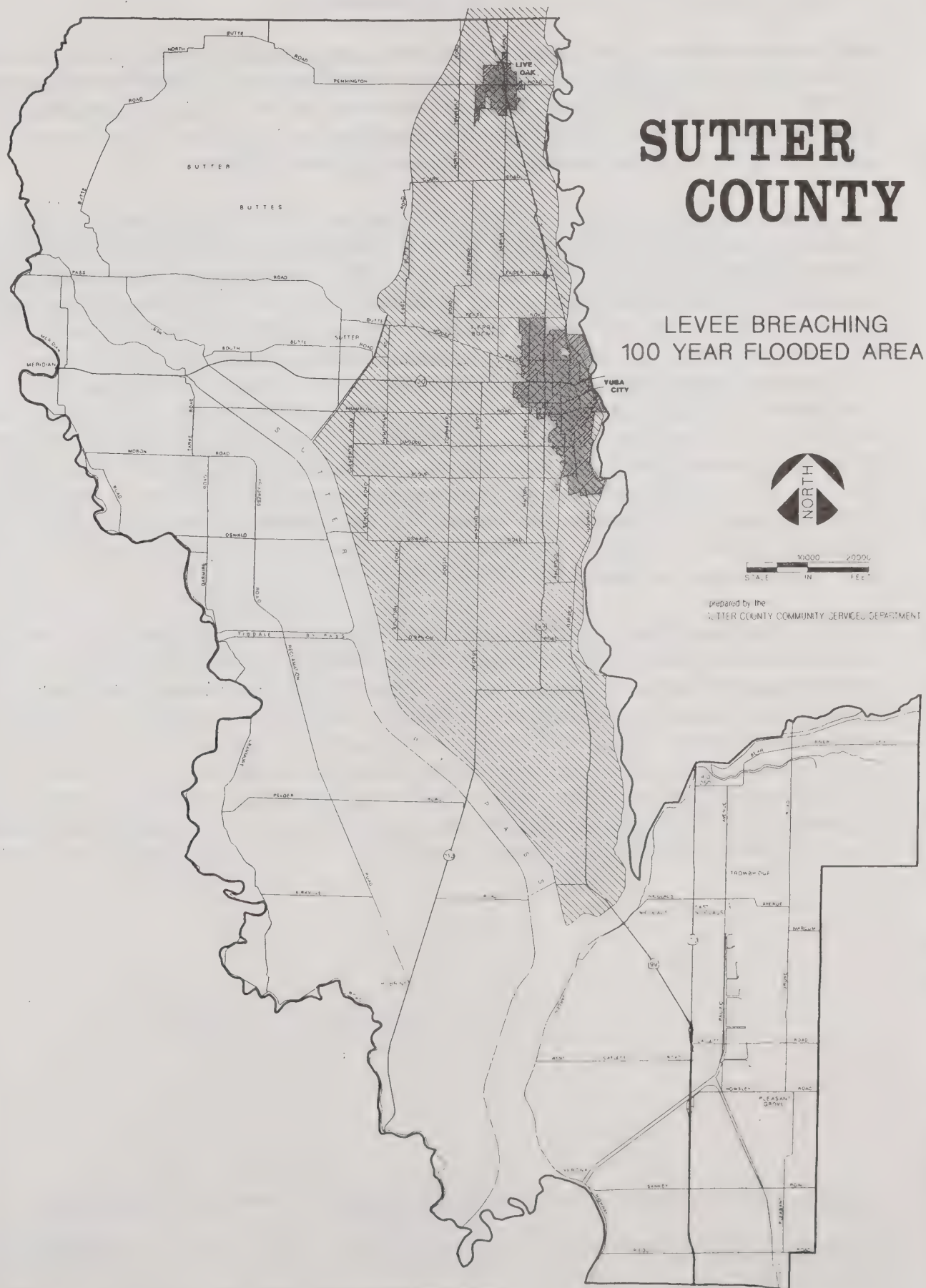


Figure 5.6-1
Levee Breaching

5.7 SUTTER COUNTY SOLID WASTE MANAGEMENT

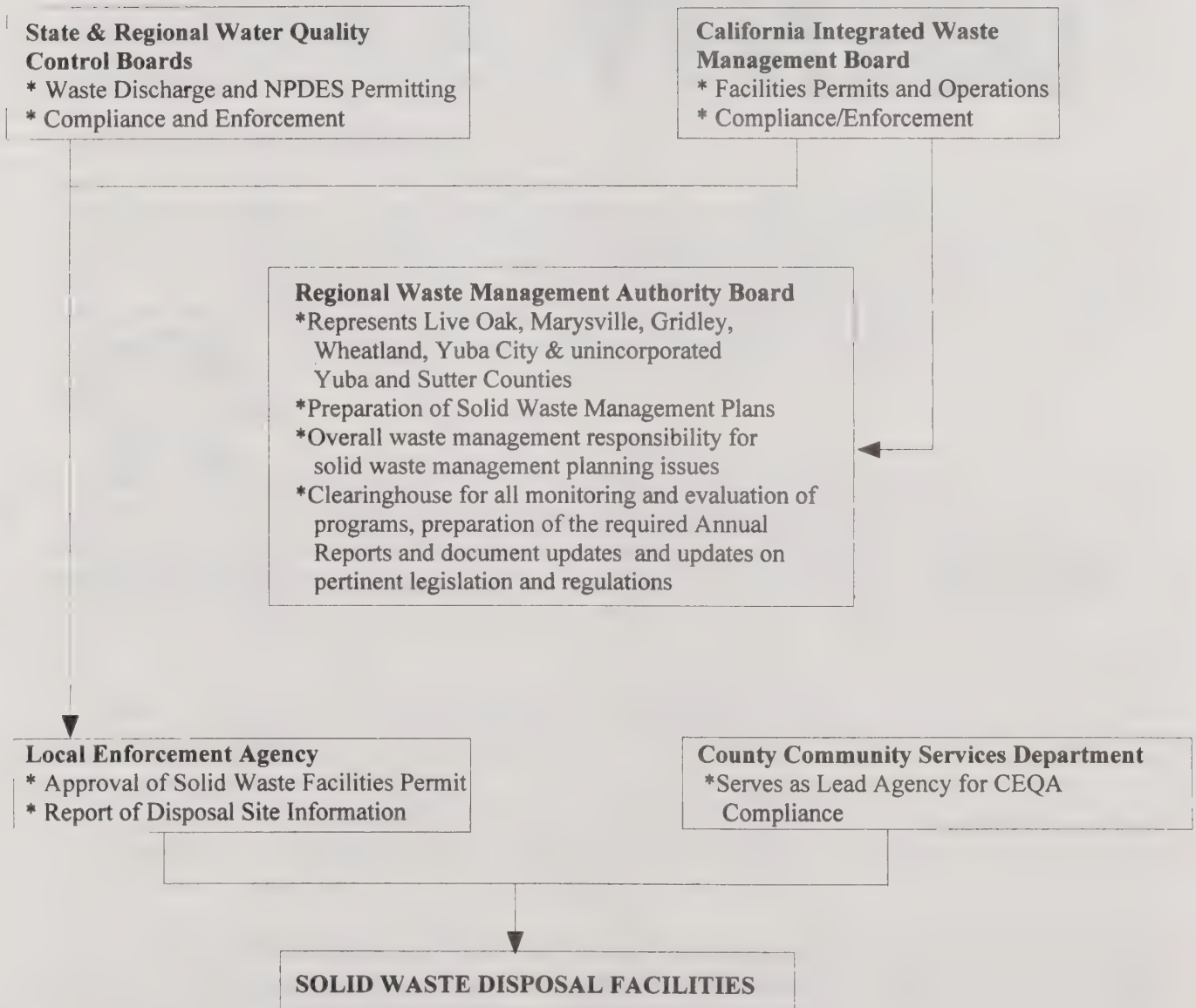
Solid waste management is a rapidly changing utility in the State of California. Due to the stricter requirements for new landfill development, changes in collection and disposal technology, source reduction and recycling efforts and increased inspection and monitoring by State and Federal agencies, additional focus is being directed on identifying and solving solid waste issues. Solid waste management plays an important role in planning growth for Sutter County.

Solid waste management for Sutter County is conducted under a joint powers agreement (JPA) with Yuba County and the cities of Live Oak, Marysville, Wheatland, Yuba City and the City of Gridley in Butte County. The agreement was entered into in 1990 to jointly address the provision of waste management services including the planning for the future provision of waste management services, and to form the Regional Waste Management Authority (previously the Bi-County Authority). The Bi-County jurisdictions have been working together on solid waste management issues since 1972. This is the only multi-county solid waste planning agency in the State of California. Solid waste management in the Bi-County region, as with any other county in the State, is conducted under Federal and State regulatory policies as implemented and enforced by the California Integrated Waste Management Board (CIWMB) and the Regional Water Quality Control Board (RWQCB). The Yuba County Environmental Health Program serves as the Local Enforcement Agency (LEA) for Sutter County which monitors solid waste facility compliance in cooperation with the CIWMB. Figure 5.7-1 shows the hierarchy of organization for solid waste management in the County and some of the various responsibilities of each component.

No solid waste management facilities or transfer stations are located within Sutter County, therefore, all information for Sutter County solid waste is presented in a Bi-County context. Existing solid waste management facilities in the Bi-County area consist of two permitted and active Class III waste disposal facilities, one permitted large volume transfer station, and one permitted materials recovery facility/transfer station. Figure 5.7-2 shows general locations of the facilities for the Bi-County region. Landfill operations are provided by a single franchised waste collector and hauler (except for YSDA self-haulers) for all jurisdictions in the region and the City of Gridley in Butte County. Approximately 161,973 tons of solid waste was generated in the Bi-County area in 1990-91 year (Source Reduction and Recycling Element, June 1992).

FIGURE 5.7-1

SOLID WASTE SERVICES ORGANIZATION



SUTTER COUNTY

YUBA COUNTY

SUTTER
COUNTY

(B)

(A)

(C)



prepared by the
SUTTER COUNTY COMMUNITY SERVICES DEPARTMENT

SOLID WASTE FACILITIES

LEGEND

(A)

Y.S.D.I. and Y.S.D.A. landfill along with the Integrated Waste Recovery Facility located on North Levee Road off of State Highway 20, approximately 2 miles northeast of the State Highway 20/70 intersection.

(B)

Ponderosa Transfer Station located on Ponderosa Way, 5 miles off of La Porte Road.

(C)

Ostrom Road landfill located on Ostrom Road approximately 2 miles east of South Beale Road.

Recycling, composting, and waste combustion programs in the Bi-County area are designed to significantly benefit waste management operations, both environmentally and economically. In 1990, approximately 24,412 tons or about 15.1 percent of the solid waste generated within the Bi-County area was diverted from the landfill. Diversion percentages are expected to increase as these waste diversion programs are amplified in response to AB 939 legislation (California Integrated Solid Waste Management Act of 1989) and as public awareness of solid waste issues improves.

The following portions of this section of the Background Report outline and expand on the waste stream, collection and disposal, recycling and source reduction, regulatory issues, financing and an overall solid waste conditions assessment for the Bi-County area. Both prevailing and proposed or planned future solid waste background information is presented.

WASTE STREAM ASSESSMENT

Almost every human activity results in the generation of solid waste. Generation quantities vary in accordance to season, geography, social attitudes and financial conditions. Solid waste generation can be broken down into two major categories: residential, which is usually considered to be household type wastes, and non-residential, which usually includes commercial and industrial. These two major categories can be further reduced to individual constituents or waste types.

Current Waste Stream

A thorough waste stream assessment of the Bi-County area, prepared for the Source Reduction and Recycling Element (SRRE) in June 1992 determined the basic aspects of the Bi-County's waste stream: quantity, composition, and sources of waste. The 1992 SRRE is the most current and thorough analysis of Sutter County's waste stream. Figure 5.7-3 shows the composition of the waste stream for the Bi-County area for 1990/1991.

Table 5.7-1 shows the quantity of solid waste generated by each jurisdiction in the Bi-County area for 1990/91. Also shown is the existing diversion rate which represents the quantity of solid waste diverted from landfilling by each jurisdiction.

According to the Source Reduction and Recycling Element, the YSDI Sanitary Landfill accommodated about 119,360 tons or 87% of municipal solid waste for the Bi-County area in 1990/91.

Table 5.7-2 shows the contribution (tons/year) to the waste stream by generator for waste collected by commercial haulers and self haulers. It is noted that approximately 44.3 percent of the solid waste being commercially hauled to the landfill is associated with residential generators. Approximately 48.8 percent of the self hauled solid waste is residential.

Analysis of the Future Waste Stream

Population variations are anticipated to have a significant impact on the Bi-County municipal waste stream. According to the population projections from Sacramento Area Council of Governments (SACOG), the population in Sutter County is expected to grow to 95,300 by the year 2005 and the population in Yuba County is expected to reach 86,088. Total population in the Bi-County area would go from its current 133,700 to 181,388 by the year 2005.

TABLE 5.7-1

**TONS PER YEAR OF SOLID WASTE GENERATED BY JURISDICTION
1990-1991**

Jurisdiction	Population	Disposed	Diverted	Generated	% Diversion
Marysville	12,324	13,117	2,673	15,790	16.9%
Yuba City	27,437	59,637	8,032	67,669	11.9%
Wheatland	1,693	1,857	180	2,037	8.8%
Live Oak	4,302	4,097	459	4,556	10.1%
Yuba County	44,273	30,563	8,581	39,144	21.9%
Sutter County	32,658	28,290	4,487	32,777	13.7%
Total	122,687	137,561	24,412	161,973	15.1%

Source: Initial Solid Waste Generation Study

Note: Diversion tonnages and percents do not include materials diverted through transformation.

FIGURE 5.7-3
WASTE STREAM COMPOSITION
Sutter County

Legend

■ Organics	41.1%	■ Plastic	6.5%
▨ Yard	14.0%	▨ Paper	17.0%
■ Metals	7.2%	■ Special	7.1%
▨ Glass	3.9%	□ Other	3.2%

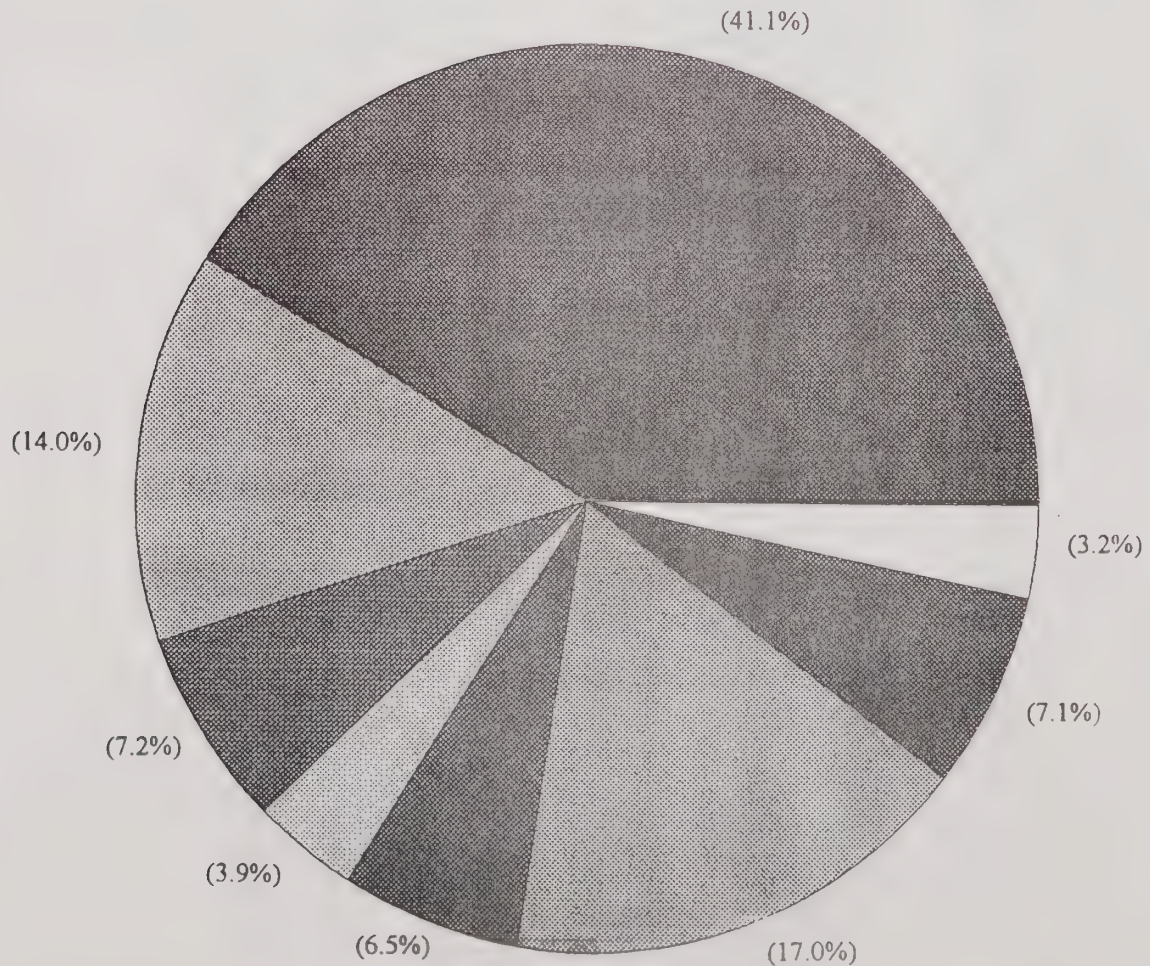


TABLE 5.7-2

SOLID WASTE COLLECTED BY COMMERCIAL HAULERS
Tons/Year

City	Residential	Commercial	Industrial	Total
Marysville	6,193	1,710	3,737	11,640
Yuba City	19,908	4,023	32,397	56,328
Wheatland	1,249	40	361	1,650
Live Oak	1,736	982	862	3,580
Yuba County	11,640	4,531	5,938	22,109
Sutter County	12,278	3,463	8,619	24,360
Total	53,004	14,749	51,914	119,667

SELF HAUL SOLID WASTE DISPOSAL ESTIMATES
Tons/Year

Facility	Residential	Commercial	Industrial	Total
YSDI Landfill	2,158	1,078	2,154	5,390
YSDA Landfill	3,754	1,877	3,753	9,384
Ponderosa Landfill	2,808	250	62	3,120
Total	8,720	3,205	5,969	17,894

Source: 1990/91 - Baseline Year from SRRE, June 1992

Commercial and industrial growth and per capita generation trends are also significant factors which will affect the future waste stream.

COLLECTION AND TRANSFER

Collection of Municipal Solid Waste

The Bi-County area is served by a single franchised private hauler who provides residential, commercial, and industrial collection services for all of the jurisdictions in the region with the exception of Beale Air Force Base. Collection service on the Base is provided by YSDI under contract with the U.S. Air Force. However, since subscription to the YSDI services is mandatory only in the City of Marysville, there is a significant amount of self-haul waste (primarily residential) from other jurisdictions. Table 5.7-3 identifies the solid waste processing and disposal facilities in the Bi-County area, the owner of the facility, the operator and the status of the facility as of 1994.

TABLE 5.7-3
SOLID WASTE FACILITIES

Facility	Land Owner	Operator	1994 Status
YSDI Sanitary Landfill - Marysville	YSDI	YSDI	Open
Yuba-Sutter Disposal Area (YSDA)	D. Barbieri	D. Barbieri	Open
Ponderosa Sanitary Landfill	US Bureau of Land Mgt	Yuba County	Inactive
Beale Air Force Base Sanitary Landfill	US Air Force	US Air Force	Inactive
Integrated Waste Recovery Facility (IWRF)	YSDI	YSDI	Open
Ponderosa Transfer Station	US Bureau of Land Mgt	YSDI	Open
Ostrom Road Sanitary Landfill	YSDI	YSDI	Open

Source: Source Reduction & Recycling Element, June 1992

Transfer Stations

Yuba Sutter Disposal, Inc. (YSDI) operates the Ponderosa Transfer Station in Yuba County and the material recovery facility/transfer station (MRF/TS) in Marysville which serves the Bi-County area. The Ponderosa Transfer Station is leased by YSDI and serves a small area in the eastern portion of Yuba County. Waste received at the Ponderosa Transfer Station is transported to a YSDI landfill for disposal.

SOURCE REDUCTION

Regulation

AB 939, the California Integrated Solid Waste Management Act of 1989, established the requirement for every jurisdiction in the State to develop comprehensive plans for the implementation of programs and policies to reduce, recycle or otherwise divert from landfill disposal, a minimum of 25 percent of each jurisdiction's solid waste stream by 1995 and 50 percent by the year 2000.

SOURCE REDUCTION PROGRAMS

Source reduction is an approach that addresses how products are manufactured, purchased, and used.

Source reduction technical objectives for the Bi-County area include:

- Encouraging residents and businesses to reduce the amount of solid waste disposed in area landfills by 1% by 1995;
- Begin development of policies specific to each jurisdiction that encourage non-procurement source reduction activities and procurement of products with post-consumer content, including compost;
- Monitor state and national source reduction legislation on an ongoing basis;
- Support state and national efforts that establish incentives to reduce packaging and for the purchase of materials with post-consumer content;
- Study the feasibility and impact of developing land use/zoning ordinances that encourage source reduction;
- Establish a procurement/waste management policy;
- Recognize individuals, businesses and institutions that have successfully implemented source reduction programs.

The Source Reduction and Recycling Element calculates that the combination of short-term and long-term proposed source reduction programs could achieve a diversion of 2.8 percent of the waste disposed in the total Bi-County area by the year 2000.

Education and Research

The purpose of the education and research programs in the Bi-County area is to provide and develop information about source reduction needs, goals, and methods and to elicit voluntary efforts by the public and private sectors to help introduce specific changes. Planned technical assistance, instructional, and promotional programs include distribution of waste audit checklists and technical

assistance materials to schools, colleges, commercial and industrial businesses, conduction of a media campaign, reduction of junk mail, encouraging bulk buying practices, and establishing an awards program to recognize successful programs.

Waste Audit Programs

The waste audit program is recommended to be provided as a service to the business community, and can be provided by the Bi-County Authority with the assistance of YSDI or other contractors as needed. The waste audit program presents an efficient system to initiate both source reduction and recycling programs in schools and businesses. The waste audit program can be conveniently implemented within the existing waste management structure of the Bi-County region.

RECYCLING

Existing Recycling Programs

Recycling is a fundamental part of the Bi-County Integrated Waste Management Plan. Present estimates indicate that approximately 14.5 percent of the Bi-County area waste stream is diverted from the YSDI landfill by recycling programs and facilities.

Commonly recycled solid waste materials in the Bi-County area include: aluminum cans, glass containers, PET containers, HDPE containers, corrugated containers, ledger and mixed paper, tin cans, newspapers and ferrous and non-ferrous metals.

Existing recycling activities and programs are predominantly operated by the private sector. Currently there are 13 existing buy-back recycling centers, certified redemption centers and scrap metal dealers in the Bi-County region. The existing buy-back and certified redemption centers collect 3,777.1 tons per year of aluminum cans, California redemption value glass, other glass containers, PET and HDPE containers, tin can, bi-metal cans, high grade ledger paper, newspaper and corrugated containers for recycling. Materials collected at these centers are shipped to dealers and end-use markets outside the Bi-County region. Scrap metal dealers collect 1,742.1 tons per year of ferrous and non-ferrous metals and white goods for recycling from the Bi-County region.

Integrated Waste Recovery Facility (IWRF)

A materials recovery facility is a centralized facility that receives, separates, processes, and markets recyclable materials. Yuba-Sutter Disposal, Inc.'s (YSDI) Integrated Waste Recovery Facility (IWRF) is located at YSDI's landfill facility in Marysville. According to the Source Reduction and Recycling Element, the IWRF diverts approximately 2,667 tons per year. Other waste diversion programs (such as recycling) in combination with the waste recovery facility are used to accomplish the diversion goals established by the State by the year 2000.

COMPOSTING

Existing Composting Programs

There is currently no permitted regional composting program established in the Bi-County area. Yard waste composting is a low technology, low cost operation that can handle a substantial portion of the municipal solid waste stream.

Composting Objectives

The Source Reduction and Recycling Element identifies a short- (1990-1995) and medium-term (1996-2000) objective for collecting, processing, and composting yard waste. The short-term objective includes the development and implementation of a plan for the collection, processing and composting of at least 10,400 tons per year of yard waste from the Bi-County jurisdictions in a permitted composting facility by the end of 1993. This targeted diversion would result in the diversion of 6.2% of the waste generated in the Bi-County region. Identifying and developing end-use markets through local and regional marketing programs is another short-term objective. Medium-term objectives would include the continued collection, processing and composting program established during the short-term planning period and developing and implementing a plan to collect, process and compost an additional 25% of the yard waste generated by the residential sector and 50% of the yard waste generated in the commercial sector by the end of 1999. Finally, continued identification and development of end-use markets through local and regional marketing programs is included in the medium-term objectives.

LAND DISPOSAL

Solid Waste Disposal Sites

There are no existing, permitted solid waste disposal facilities in the cities of Live Oak, Wheatland and Yuba City, or within the unincorporated area of Sutter County. Solid waste from these jurisdictions is collected by Yuba-Sutter Disposal, Inc. under franchise contract agreements and is disposed of at the YSDI Landfill, located in Marysville. Selected loads of solid waste from these jurisdictions are processed through the YSDI Integrated Waste Recovery Facility located adjacent to the landfill in Marysville. Recyclable solid wastes are separated from the solid waste loads; the residual waste is disposed of at the YSDI landfill.

The YSDI landfill is permitted as a Class II-2 (new classification system, Class III) landfill located on North Levee Road in Marysville, off of Hwy. 20 approximately 2 miles northeast of its intersection with Hwy. 70. The site is permitted to accept municipal residential and commercial wastes, tires, construction and demolition debris, and prune pulp and sludge in limited quantities. The current average quantity of waste received is 400 tons per day, six or seven days per week, or approximately 118,000 tons per year. The site consists of 126 acres of which 103 acres have been designed to be used as a landfill.

The YSDI Integrated Waste Recovery Facility is located adjacent to the YSDI landfill. The facilities share a common entrance station and access road. The facility consists of a 44,400 square foot processing building and approximately 4 acres of paved parking and temporary storage area. Material recovery equipment includes feed conveyors, a picking conveyor, electromagnet separator, shaker screen, baler, rotary air separator, and glass conveyor/crusher. The IWRF receives municipal residential and commercial wastes at a daily throughput capacity of 150 tons per day, operating an 8-hour shift. The facility is located on an 18-acre parcel adjacent to the YSDI landfill.

YSDI has recently opened a new Class III landfill on Ostrum Road in Yuba County. The site was opened in the Spring of 1995 and has a capacity of approximately 6.5 million tons. The estimated life of this site is approximately 45 years.

The Yuba Sutter Disposal Area (YSDA) Landfill is permitted as a Class II-2 (new classification system, Class III) landfill located on North Levee Road in Marysville, on the southeast side of Hwy. 20, approximately .5 miles northeast of the intersection of 22nd Street and Hwy. 20. The site accepts garden and tree trimmings, residential and commercial wastes, tires, construction and demolition debris, and triple-rinsed pesticide containers from all jurisdictions in the Bi-County region and from some neighboring counties. The landfill site receives approximately 9,384 tons per year of solid waste. The site is 208 acres in size with landfill operations occupying approximately 31 acres.

The Beale Air Force Base Landfill No. 3 is located on the Base and is owned by the U.S. Air Force Strategic Air Command. The landfill was permitted as a Class II-2 and was closed in September of 1993. The 274-acre site previously accepted residential and commercial wastes, construction and demolition debris, dead animals and infectious waste. Average annual loading was 5,700 tons per year.

The Ponderosa Landfill is permitted as a Class II (old classification system) landfill located on a parcel leased by Yuba County from the Bureau of Land Management and is currently operated by Yuba County. When the Ponderosa Transfer Station opened in April 1992, the landfill ceased accepting solid waste and was subsequently closed. The Ponderosa Landfill is comprised of approximately 80 acres of which approximately 62 was used for landfilling. The site is located off Ponderosa Way, approximately one-half mile off La Porte Road and one mile southwest of Brownsville in northeastern Yuba County.

The Ponderosa Transfer Station commenced operation in April 1992. The station is located on a 40-acre parcel leased by Yuba County from the Bureau of Land Management and is owned and operated by Yuba-Sutter Disposal, Inc. The Transfer Station will only accept wastes that can be disposed of at the Class III (new classification system) YSDI landfill in Marysville. It is expected that the transfer station will receive primarily residential waste, but also small quantities of commercial wastes and construction and demolition debris. The average daily throughput is expected to be 20 tons per day, three days per week. The transfer station is located on a .625-acre portion of the 40-acre leased parcel.

Regulatory Approval and Compliance

Regulatory permitting, compliance inspection, and enforcement for solid waste facilities falls with the Local Enforcement Agency (Yuba County Environmental Health Division) at the local level and the California Integrated Waste Management Board and the Regional Water Quality Control Board at the State Level. YSDI Landfill operates under Facilities Permit No. 51-AA-005 which was issued in 1980. The Integrated Waste Recovery Facility operates under Solid Waste Facilities Permit No. 58-AA-0008. The Yuba-Sutter Disposal Area Landfill operates under Solid Waste Facilities Permit No. 51-AA-006. The Beale Air Force Base Landfill No. 3 operates under Solid Waste Facilities Permit No. 51-AA-001. The Ponderosa Landfill operates under Solid Waste Facilities Permit No. 51-AA-002. The Ponderosa Transfer Station operates under Solid Waste Facilities Permit No. 58-AA-0010.

Leachate Control

Leachate, or moisture coming from or passing through the landfill, is a potentially significant problem if it enters the groundwater. Obviously, the character or chemical composition of the leachate determines the significance of the contamination. New Federal Regulations that went into effect October 9, 1993 require municipal landfills to utilize liners with a leachate collection, removal and monitoring system.

YSDI has operated with a composite liner system since 1988. This liner consists of one foot of compacted clay over the compacted native soil. A 60 mil High Density Polyethelene (HDPE) liner is then placed on top of the clay layer. YSDI currently utilizes a Leachate Collection and Removal System (LCRS) that consists of a drainage system above the liner that directs the leachate to a surface impoundment where a sump pump collects the leachate in a tank trailer. The leachate is tested for chemical composition and then transported to the Marysville sewer treatment plant for proper disposal. There are approximately 10 groundwater monitoring wells around the YSDI facility.

Capacity of Existing Landfills

The total remaining capacity in the YSDI Landfill is anticipated to be exhausted in 1996 or in 1997 and the remaining capacity of the YSDA facility exhausted by 2004. Beale Air Force Base landfill ceased operations in September of 1993.

Closure and Post-Closure Maintenance

Once the YSDI Landfill reaches capacity, closure and post-closure care procedures are implemented to minimize potential adverse environmental effects. Closure involves capping the landfill with a low-permeability material to minimize moisture infiltration, development and maintenance of surface drainage control structures, and maintaining the function of leachate and methane collection and monitoring equipment. Post-closure care involves inspections of the site, environmental monitoring, land surface maintenance, leachate transport and treatment, and methane control. Post-closure maintenance is considered a long-term obligation and is mandated by State law, overseen by the CIWMB.

Siting a New Landfill

There is one solid waste facility planned to be developed in the Bi-County region during the short- and medium-term planning periods; a composting facility at the YSDI landfill. No other new solid waste facilities are currently planned within Sutter or Yuba Counties.

SPECIAL WASTES

Current Special Waste Management

Special wastes are relatively large, identifiable materials from the general municipal solid waste stream that have the potential to be segregated, reused, recycled, or disposed in a manner uniquely suited to that waste. These wastes are usually generated by an easily defined group of commercial, industrial, or institutional businesses and are frequently subject to regulation by multiple government agencies. The overall goal of this program is to increase the quantity of waste diverted from landfills and transformation facilities and to reduce the hazards associated with special waste.

Infectious Waste

A public information campaign is proposed to encourage all veterinary clinics, hospitals, and medical and dental practices to properly dispose of infectious waste.

Construction and Demolition Debris

Construction and demolition debris is made up of a variety of waste material which includes steel, asphalt, concrete, brick, plaster, wallboard, and piping. Some of this material may contain hazardous substances such as asbestos.

The Bi-County Authority plans to work with the operators of the YSDA and YSDI landfills to establish a reduced tipping fee for individuals and contractors bringing clean, source separated loads of wood waste and concrete and asphalt debris to the landfills. Separate areas for stockpiling and processing of these materials would be designated at the landfills.

Used Tires

Scrap tires are a concern for the Bi-County area since stockpiled and littered tires have negative aesthetic impacts and increase the risk of fire and disease. Medium-term planning (1996-2000) objectives include evaluating alternatives and implementing a used tire management program.

PUBLIC EDUCATION AND INFORMATION

A successful waste diversion program will depend greatly on widespread participation fostered through ongoing information and public relation programs conducted throughout the Bi-County region.

The Bi-County Authority along with participating jurisdictions are responsible for implementing public education programs to reach all generator sources within the population in order to assure maximum efficiency and movement towards the 25% and 50% diversion goals and waste diversion behavioral patterns.

FINANCING AND REVENUES

Multi-jurisdictional Factors

A regional approach to solid waste management offers a number of potential financing advantages.

Recycling and composting require a large scale waste generation and collection base in order to generate a marketable product. Regional waste management assures a consistent supply of materials, allowing the Bi-County region to achieve economies of scale through better utilization of capital and more efficient management.

Operating Revenue

Since garbage collection is not mandatory in most of the jurisdictions in the Bi-County area and the commercial regulatory fees vary depending on the type of bin and pick-up service provided, the total amount of the regulatory fees vary from year to year. Currently, the regulatory fees provide \$300,000 to \$350,000 per year. Implementation of mandatory solid waste collection in urbanized areas would increase the annual amount of regulatory fees collected to support the Source Reduction and Recycling Element programs.

One half of the regulatory fees collected (\$150,000 to \$175,000 annually) are used by YSDI to fund the permanent Household Hazardous Waste collection facility, the load checking program, the public education and information program and a corporate education/compliance program for hazardous waste. The other half of the regulatory fees are designated for the local enforcement agency and other planning and program uses by the Regional Waste Management Authority.

OVERALL SOLID WASTE ASSESSMENT

Because provision of solid waste management services will be managed by the Regional Waste Management Authority, all of the jurisdictions share common goals and objectives, programs recommended for implementation, monitoring and evaluation programs and funding methods. Planning for solid waste disposal has also been facilitated by the common waste hauler and material recovery facility shared by the Bi-County jurisdictions.

Diversion of materials is a primary strategy for reducing the burdens on landfills. Table 5.7-4 describes short-term and medium-term programs for diverting solid waste from landfills. These measures are contained within the 1992 Bi-County Source Reduction and Recycling Element.

TABLE 5.7-4

INTEGRATION OF MEDIUM-TERM PLANNING PERIOD DIVERSIONS

Program	Live Oak		Marysville		Sutter County		Wheatland		Yuba City		Yuba County		Bi-County Total	
	(TPY)	(%)	(TPY)	(%)	(TPY)	(%)	(TPY)	(%)	(TPY)	(%)	(TPY)	(%)	(TPY)	(%)
Short-Term Planning Period														
Existing Diversion w/out IWRF	382.0	8.4%	2,221.0	14.1%	3,977.7	12.1%	108.0	5.3%	7,068.6	10.4%	7,986.4	20.4%	21,744	13.4%
Source Reduction Programs	40.0	0.9%	131.0	0.8%	283.0	0.9%	19.0	0.9%	596.0	0.9%	306.0	0.8%	1,375	0.8%
Increase Corrugated Collection Rt.	30.5	0.7%	92.2	0.6%	45.8	0.1%	0.0	0.0%	283.5	0.4%	68.6	0.2%	521	0.3%
Office Paper Recycling Program	7.2	0.2%	13.3	0.1%	39.7	0.1%	0.6	0.0%	30.3	0.0%	54.7	0.1%	146	0.1%
YSDI Curbside/Kiwanis Newspaper	5.7	0.1%	16.2	0.1%	42.9	0.1%	2.2	0.1%	35.9	0.1%	58.1	0.1%	161	0.1%
Buy-Back Promotion	14.4	0.3%	39.2	0.2%	85.6	0.3%	6.3	0.3%	119.8	0.2%	106.2	0.3%	372	0.2%
Buy-Back Center-North Yuba Co.	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	71.5	0.2%	72	0.0%
IWRF Diversion/Existing and 2nd shift (w/out yard waste and wood)	549.9	12.1%	1,457.2	9.2%	2810.6	8.6%	282.7	13.9%	4,208.0	6.2%	2,143.2	5.5%	11,452	7.1%
Compost Yard Waste from IWRF	479.4	10.5%	1,272.8	8.1%	2,451.5	7.5%	246.9	12.1%	3,670.3	5.4%	1,871.9	4.8%	9,993	6.2%

TABLE 5.7-4 CON'T.

INTEGRATION OF MEDIUM-TERM PLANNING PERIOD DIVERSIONS

PROGRAM	Live Oak		Marysville		Sutter County		Wheatland		Yuba City		Yuba County		Bi-County Total	
	(TPY)	(%)	(TPY)	(%)	(TPY)	(%)	(TPY)	(%)	(TPY)	(%)	(TPY)	(%)	(TPY)	(%)
Medium-Term Planning Period														
Existing Incineration	0.0	0.0%	112.4	0.7%	2,413.0	7.4%	0.0	0.0%	13,584.3	20.1%	1,710.0	4.4%	17,820	11.0%
Incinerated Wood from IWRP	0.7	0.0%	2.0	0.0%	3.8	0.0%	0.4	0.0%	5.7	0.0%	2.9	0.0%	16	0.0%
C&D Debris Program - wood waste	210.0	4.6%	720.0	4.6%	1,352.0	4.1%	66.0	3.2%	3,092.0	4.6%	1,262.0	3.2%	6,702	4.1%
C&D Debris Program - inert solids	46.0	1.0%	104.0	0.7%	84.0	0.3%	6.0	0.3%	308.0	0.5%	86.0	0.2%	634	0.4%
Add Res. Yard Wst. Composting	145.0	3.2%	409.0	2.6%	915.0	2.8%	97.0	4.8%	1,866.0	2.8%	768.0	2.0%	4,200	2.6%
Commercial Yard Wst. Composting	38.0	0.8%	71.0	0.4%	78.0	0.2%	3.0	0.1%	161.0	0.2%	107.0	0.3%	458	0.3%
New Source Reduction Programs	90.0	2.0%	316.0	2.0%	656.0	2.0%	40.0	2.0%	1,354.0	2.0%	782.0	2.0%	3,238	2.0%
Recycle Residential Corrugated	23.0	0.5%	205.0	1.3%	320.0	1.0%	24.0	1.2%	398.0	0.6%	429.0	1.1%	1,399	0.9%
Increase Res. Containers Recycling	79.0	1.7%	340.0	2.2%	690.0	2.1%	54.0	2.7%	1,084.0	1.6%	673.0	1.7%	2,920	1.8%
Recycle Residential Mixed Paper	110.0	2.4%	299.0	1.9%	556.0	1.7%	60.0	2.9%	1,119.0	1.7%	978.0	2.5%	3,122	1.9%
Inc. Comm. Corrugated Recycling	27.0	0.6%	72.0	0.5%	77.0	0.2%	3.0	0.1%	164.0	0.2%	106.0	0.3%	449	0.3%
Divert Industrial Food Waste	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	4,600.0	6.8%	0.0	0.0%	4,600	2.8%
TOTAL	2,278	50.0%	7,893	50.0%	16,882	51.5%	1,019	50.0%	43,749	64.7%	19,571	50.0	91,391	56.4%

Source: SRRE, June 1992

5.8 FINDINGS

General Facilities and Services

- Facility and services standards relate directly to a community's values and goals. Standards are used to quantify the specific amount or type of a facility or service that is required to maintain a desired quality of life.

Public Water Supply

- Three of the four large Public Water Supply Systems reviewed have groundwater as their primary source.
- At the present time, adequate groundwater and surface water is available to meet future demand requirements.
- Existing water treatment and distribution systems are adequate for near-term demand requirements.
- Future development will likely require additional water treatment, distribution, and storage facilities.
- Long-term maintenance of groundwater resources requires that a significant portion of water for agricultural and urban uses be provided through surface water supplies.
- Sutter County has a long-term interest in protecting existing local water rights, promoting the development of new local water supplies and by discouraging transfer/export sales.

Groundwater and Wells

- Groundwater supplies appear to be adequate to meet current user demands.
- Portions of the County are affected by groundwater contamination problems. Some of the water quality problems are naturally occurring, while others have resulted from human activity; i.e., application of agriculture chemicals, improper or high density septic system installation, and wells that are not constructed or abandoned properly, or are poorly maintained.
- Additional groundwater studies will be necessary to accurately identify the limits of contamination.
- Developed areas with nitrate contamination problems will need a comprehensive remediation/protection strategy to maintain public health and to protect groundwater resources.

Public Wastewater Systems

- In general, existing community wastewater collection, treatment, and disposal systems in the County are capable of meeting the existing regulatory and service demands.
- Future development, even on septic systems which rely on Yuba City's treatment plant for the disposal of solids, will likely trigger a need for additional wastewater collection and treatment facilities.

On-site Wastewater Systems

- In general, the valley area that comprises most of Sutter County is not considered conducive to on-site sewage disposal. This is due to a number of factors including shallow soil and groundwater conditions and poor soil permeability. Additional urban or suburban growth in the unincorporated areas of the County should be supported by community wastewater treatment facilities.
- Water quality information for the communities of Sutter, Tierra Buena, and the Yuba City Urban Area indicates that moderate density use of septic systems can result in groundwater contamination. Community wastewater systems should be provided to these areas to protect public health and ensure continued use of developed properties.
- Areas outside the urban areas and rural communities will continue to rely on the use of on-site sewage disposal systems.

Drainage and Flood Control

- Certain previously performed drainage studies (Yuba City Urban Area) have provided good information for a specific area. The majority of the County does not have adequate drainage information available to support appropriate planning and design. Detailed information on flooding is lacking.
- Flood conditions are determined to exist in a number of areas. Of particular concern is the Yuba City Urban Area.
- Increases in total storm water runoff resulting from new development can create significant impacts on landowners in areas where storm water runoff accumulates.

Solid Waste Management

- At its present rate of fill, the YSDI facility has capacity to 1996 or 1997. A new landfill to serve the Bi-County area has been approved on Ostrom Road in Yuba County with a 45-50 year capacity.

- Implementation of mandatory waste stream quantity diversions to meet the State AB 939 (Public Resources Code 41780) requirements will involve source reduction and recycling efforts to reduce waste stream quantities by a minimum of 25 percent by 1995 and 50 percent in the year 2000.
- A County-wide Household Hazardous Waste processing facility was opened in 1991 in Yuba City in an effort to eliminate household hazardous wastes from the waste stream.
- Both short-term and medium-term programs have been outlined in the Integrated Waste Management Plan for implementation in the Bi-County region and Gridley.

5.9 GLOSSARY

AB - State Assembly Bill

CAA - Clean Air Act

CEQA - California Environmental Quality Act

CIWMB - California Integrated Waste Management Board

CoSWMP - County Solid Waste Management Plan

DHS - Department of Health Services

EPA - United States Environmental Protection Agency

HHW - Household Hazardous Waste

IWMP - Integrated Waste Management Plan

LEA - Local Enforcement Agency

MRF - Materials Recovery Facility

M&R - Monitoring and Reporting

RWQCB - Regional Water Quality Control Board

SRRE - Source Reduction and Recycling Element

SWAT - Solid Waste Assessment Test

5.10 PERSONS CONSULTED

Community Water Systems

Barrett, Bob, Public Works Director. Sutter County

Coupe, Art, Operations Manager. Hillcrest Water Company

Musallam, George, Senior Civil Engineer. Sutter County

Peterson, Larry, Treatment Plant Superintendent. City of Yuba City

Groundwater and Wells

Baltimore, Barbara. Sutter County Environmental Health

Dudley, Toccay. Department of Water Resources, 322-7164

Swatsenberg, Betty. Department of Water Resources

Community Wastewater Systems

Babb, Annette, Secretary. Sutter Community Services District

Barrett, Bob, Public Works Director. Sutter County

Epperson, Dale. City of Live Oak

King, Rich. Planning Consultant to City of Live Oak

Musallam, George, Senior Civil Engineer. Sutter County

Peterson, Larry, Treatment Plant Superintendent. City of Yuba City

Solid Waste Systems

Fuji, Kurt, Site Engineer. Yuba Sutter Disposal, Inc.

Givens, Jim. Yuba Sutter Disposal, Inc.

Martin, Keith. Regional Waste Management Authority

Scocci, Remo, General Manager. Yuba Sutter Disposal, Inc.

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CHAPTER 6

PUBLIC SERVICES

6.1 INTRODUCTION

This chapter describes the existing services provided through the County of Sutter, services provided by special districts, as well as some public utility services provided by private companies. The public services discussed are: 1) general government, 2) law enforcement, 3) fire protection, 4) education, 5) utility services, and 6) special districts.

6.2 GENERAL GOVERNMENT

BOARD OF SUPERVISORS

Sutter County was one of the original counties created in 1850 by the first State Legislature. The County is governed by a five member Board of Supervisors who are elected by district to staggered four-year terms. The terms of the Supervisors overlap, with the voters electing a representative in Districts 1, 4, and 5 during Presidential election years, and Districts 2 and 3 in State general election years. Supervisorial districts vary greatly in geographic size, but they each contain approximately the same population. The District boundaries are redrawn after each census to ensure an even distribution of the population.

The Board of Supervisors exercises the legislative, administrative, and appellate powers prescribed to it by the California Constitution and Statutes as well as the Sutter County Charter. Similar to a corporate board of directors, but with broader powers, the Board of Supervisors sets policy for the County and its operations. The Board appoints the Chief Administrative Officer and all department heads with the exception of the following positions: Assessor, Auditor, Clerk-Recorder, District Attorney, Municipal and Superior Court Judges, Sheriff-Coroner, Superintendent of Schools, and Treasurer-Tax Collector. These positions are elected by the citizens of Sutter County. The Board also serves as the governing body of a number of special districts with individual members serving on intergovernmental committees, bi-county agencies, and policy making bodies.

CITY COUNCILS

Within Sutter County there are two general law cities that are governed by individual city councils: The City of Live Oak and the City of Yuba City.

BI-COUNTY AGENCIES

Between Sutter and Yuba Counties there are a number of Bi-County agencies that have been established through memorandums of understanding (MOU) between the two counties. This arrangement allows the counties to address regional issues that affect both jurisdictions through shared resources. Current Bi-County Agencies include: Regional Waste Management Authority, Yuba-Sutter Transit, Yuba-Sutter Economic Development Corporation, Bi-County Transportation Agency, and Feather River Air Quality Management District.

COUNTY GOVERNMENT ORGANIZATION

County Administrative Officer

Like the CEO of a major corporation, the County Administrator is responsible to the Board of Supervisors for the day-to-day administration of all County departments. The County Administrator provides staff support to the Board by conducting research and providing policy recommendations, submitting an annual budget, monitoring the fiscal condition and overall effectiveness of County programs and generally seeing that Board policy is carried out. The duties of the County Administrator are delineated in State Statute and County Ordinance.

Assessor

The County Assessor is an elected official charged by law with the annual responsibility of preparing the assessment rolls from which local property taxes are derived. The Assessor oversees a department that is responsible for determining the value of residential, industrial, commercial, and personal property for tax purposes. Once the Assessor has determined and assembled information regarding the appropriate assessed value of property, this information is provided to the County Auditor/Controller, who applies tax rates, and to the County Treasurer/Tax Collector, who issues tax bills. The three departments, together, comprise the overall Property Tax Administration function for the County.

Auditor-Controller

The Auditor-Controller, an elected official, is the chief accounting officer of the County. The responsibilities of the office include maintaining the fiscal records of the County and those special districts governed by the Board of Supervisors. In addition, control accounts are maintained for self-governed special districts and school districts depositing money with the County Treasurer. The traditional auditor functions include auditing special districts, auditing treasury cash and investments, accounting for payments and receipts, budget control, financial reporting, payroll and cost accounting. The controller function is to oversee departments, with emphasis on internal control, economy and efficiency.

Agricultural Commissioner

Appointed by the Board of Supervisors for a four-year term, the County Agricultural Commissioner is responsible for the local administration of certain state and local laws and regulations which protect the environment, public health and safety, agriculture, and the consumer. The Agricultural Commissioner is also the County Sealer of Weights and Measures; Director, Underground Storage of Hazardous Materials; and Ex-officio Air Pollution Control Officer, for the purposes of enforcement of open burn regulations.

Community Services Department

The Community Services Department is a combination of programs which include Planning, Building Inspection, Environmental Health, Fire and Emergency Services and the Animal Control functions. The department is a consolidation of services related principally to the development process which include distinct program functions within it. The following briefly describes each program in the Community Services Department.

Animal Control - This Program provides animal control services for the unincorporated area of Sutter County, the City of Live Oak and the City of Yuba City. The services include animal licensure, investigation of animal bites and the quarantine of animals.

Building Inspection - The Building Program is responsible for administering the building, electrical, plumbing, and zoning codes adopted by the County as control measures for public safety. The Program checks plans, issues construction permits, and inspects buildings and structures at all stages of construction alteration, and repair for safety and conformity with State and local codes.

Code Enforcement - This Program is responsible for inspection, investigation and enforcement of violations involving building, housing, zoning, sanitation, and other related codes, ordinances, and regulations. The Program issues citations, assists in cases for public hearings and testifies in court.

Environmental Health - Environmental Health consists of organized activities undertaken to protect and enhance the public's health through the control of potentially harmful materials, organisms, energies and conditions in the environment. Environmental Health services and programs include: food, housing and institutions, water-orientated recreation, safety, vector control, wastes management, water supply, air sanitation, land development and use, and related services and programs as required by the Board of Supervisors.

Fire and Emergency Services - This Program is responsible for liaison between the County and local fire organizations. The Administrator coordinates and administers the fire protection programs and activities of five fire districts operating as County Service Areas. He serves as Chief of the Sutter Fire Department and directs the work of career captains and volunteer chiefs. This position is also responsible for managing and directing the Office of Emergency Services.

The office prepares and maintains emergency plans and training programs to respond to routine incidents such as hazardous materials releases, and major calamities such as floods or major transportation accidents.

Planning - The Planning Program encompasses current and advanced planning functions which are responsible for the administration of the County General Plan, the zoning code, the subdivision ordinance, the California Environmental Quality Act, and the preparation of plans which guide the physical development of the County. The Program is responsible for providing support to the County Planning Commission in addition to serving as staff to the Local Agency Formation Commission.

County Counsel

Appointed by the Board of Supervisors for a four-year term, the County Counsel serves as the chief legal counsel to the Board of Supervisors. In this capacity, the Counsel also serves as legal counsel to all county departments, LAFCO, some special districts, and the boards and commissions established by the Board of Supervisors. The Counsel is responsible for advice on legal matters, written legal opinions, review of county contracts, personnel hearings and arbitrations, overseeing litigation and represents the County in administrative hearings.

Personnel Department

The Personnel Department is a centralized merit systems agency providing the following services to County departments: labor relations; recruitment and selection; classification and salary administration; administration of personnel rules and regulations; deferred compensation; unemployment insurance; risk management.

Public Guardian-Conservator

The department, when appointed by the court, serves as conservator of persons, and/or the estate of persons, who are unable to manage their personal and/or financial affairs by reason of a mental or physical disability.

Treasurer-Tax Collector

The Treasurer-Tax Collector is an elected official who is responsible for the taxing, collection, and control of County funds. The office is responsible for investment and safeguarding of County and school district funds; tax collection which includes billing collecting and processing county taxes; and central collections, which collects funds for most departments within the county. In addition the office acts as the tax collector for both cities, school districts and special districts within the County.

Public Protection

County Clerk Recorder

The County Clerk/Recorder is an elected official who serves as the Clerk of Superior Court, and is responsible for filing all civil, criminal, probate, and juvenile cases, taking minutes and scheduling court proceedings. In addition, the clerk registers voters, conducts elections, records vital statistics and real estate documents, maintains files on corporate and fictitious business names, issues marriage licenses, and may perform civil marriages.

The Clerk/Recorder is also the ex-Officio Clerk of the Board of Supervisors. This office is charged with the responsibility for the safekeeping of all books, papers, and records which are deposited with this office, in accordance with state law. This office attends all meetings, and maintains all minutes and records of the Board of Supervisors, the Assessment Appeals Board, and other Board of Supervisors functions.

Court, Superior

The Superior Court has jurisdiction for civil cases over \$25,000 and for all felony cases. It is responsible for Probate, Domestic Relations and Juvenile Court. Superior Court is responsible for the selection of the Grand Jury. The Court is currently composed of three judges.

Court, Municipal

The County Municipal Courts have jurisdiction over civil cases involving amounts up to \$25,000 and presides over preliminary hearings in felony cases to determine whether there is reasonable and probable cause to hold a defendant for further proceedings in Superior Court. There are two Municipal Court Judges in the County.

District Attorney

The District Attorney is an elected official who serves as the chief law enforcement officer of the County and acts as the public prosecutor for all criminal violations of state and county laws and ordinances. In addition, the District Attorney operates a family support division that enforces child and family support obligations; investigates and prosecutes criminal child abuse; operates a welfare fraud unit to investigate welfare and public assistance fraud; and provides enforcement of environmental health, planning and building code violations.

Grand Jury

The Grand Jury is a body of 19 electors who are selected annually from a panel of prospective jurors by the Superior Court. The Grand Jury hears evidence of criminal matters presented by the District Attorney and judges if there is sufficient evidence to present an indictment to the Superior Court. The Grand Jury also investigates the operation accounts and records of the County departments and inquires into misconduct by any public office within the County.

Probation

The Probation Department provides mandated and discretionary probation services to the adult and juvenile courts of the County. The department is divided into four basic units: Juvenile Services, Adult Services, Administrative Services, and Youth and Adult Services. The services provided by the department include investigations, sentence recommendation, supervision of persons placed on probation, custody mediation, domestic violence diversion, truancy, and child custody investigation. The department operates under the direction of the Probation Officer who is appointed by the presiding judge of the Juvenile Court.

Public Defender

The Public Defender offers legal counsel to those citizens who have been charged with a criminal offense and who are not able to provide for their own legal defense. The Public Defender provides counsel at the request of the defendant or of the court.

Sheriff-Coroner

A detailed description of the Sheriff's Department's duties and responsibilities are discussed in Section 6.3.

Public Assistance/Health

Human Services Department

The Human Services Department provides a combination of services including Mental Health, Welfare and Public Health. The following briefly describes the services offered within each area.

Mental Health - Bi-County Mental Health is responsible for the treatment of the mentally ill, drug abusers, and alcohol abusers of Sutter and Yuba Counties. The programs provided offer direct services to patients and families, as well as maintaining contracts with various community organizations who also provide services to the bi-county population.

Public Health - Sutter County Public Health consists of Administration, Public Health Nursing, Public Health Laboratory Services, and Special Health Programs/Health Education. The services are provided in accordance with the mandates of the Health and Safety Code or the California Code of Regulations. These services are generally directed toward the identification, removal and control of the causes of disease which affect the community as a whole.

Welfare - Welfare is responsible for the administration of federal, state and county funded public assistance and social welfare programs. These programs include Aid to Families with Dependent Children, Food Stamp, Medi-Cal, Independent Living Program, Domestic Violence, Child Abuse Prevention and Treatment, In-House Support Services, and the County General Relief Program.

Education

Library

The Sutter County Library is a resource center for County residents with intellectual interests. The Library provides books, records, and other materials to fill a variety of individual needs. The main branch is located in Yuba City, with branch offices located in the City of Live Oak, and the communities of Pleasant Grove, Rio Oso, and Sutter.

Museum

The museum is responsible for the preservation and interpretation of the cultural history of Sutter County. In addition, museum staff is responsible for maintaining professional museum standards of artifact conservation, research, and public education.

Farm Advisor

The Bi-County Farm Advisors' service is shared between Yuba and Sutter Counties. Sutter County is responsible for administering this program, but the department is run by the University of California Cooperative Extension Service. The major emphasis of this program is on agricultural research and education, 4-H youth development activities, farm and home economic information, and the Master Gardener program for the general public.

6.3 LAW ENFORCEMENT

Law enforcement in Sutter County is provided by two principal separate agencies, the Sutter County Sheriff, and the California Highway Patrol.

SUTTER COUNTY SHERIFF

The Sutter County Sheriff's Department (SCSD) is responsible for crime prevention, law enforcement, and criminal investigation in the unincorporated areas of the County and the City of Live Oak. The SCSD operates the County jail and acts as bailiff for the County court system. The SCSD functions as the County Coroner, and investigates all violent deaths and those deaths where there is no certified cause. The SCSD also functions as the Public Administrator for the County. In this capacity the SCSD is responsible for the investigation of facts pertaining to the death of persons with no known heirs, and the administration of their estate.

The SCSD has its main office at the Law Enforcement Center in Yuba City, with resident deputies in Meridian, Robbins, and Pleasant Grove. The existing County jail is also located at the Law Enforcement Center.

The SCSD maintains close working relationships with other law enforcement agencies in the area. The SCSD currently has mutual aid agreements with the California Highway Patrol, the Yuba City Police Department, the Yuba County Sheriff Department, and the Marysville Police Department. Law enforcement services are provided for the City of Live Oak through a contractual agreement.

Service

At present (1996) the SCSD has approximately 53 sworn and 72 non-sworn personnel or limited sworn personnel. The sworn personnel are the sheriff, officers, and deputies. The non-sworn personnel consist primarily of clerical staff, while limited sworn personnel are the correctional officers and bailiffs.

The SCSD maintains 10 patrol areas in the County. Deputies are generally assigned 2 patrol areas during a single shift. Shifts are 8 hours long (days, swing, and graveyard), with deputies working 5 days on and 2 days off. The SCSD also has 4 K-9 units and one patrol boat that operates year-round.

Issues and Concerns

At present, the SCSD is operating with 1 sworn personnel per 665 unincorporated County residents.

In October of 1994, the County expanded its jail facilities and added 148 beds for minimum security prisoners. This expansion has increased total capacity to 293. Throughout 1995, the number of inmates peaked between 250 - 260. As of February 1996, SCSD is awaiting funding from the state to expand the facility by 32 more beds within the next year. This additional capacity should provide surplus capacity for the next 2 to 5 years.

CALIFORNIA HIGHWAY PATROL

The California Highway Patrol (CHP) is the primary law enforcement agency for State highways and roads in the unincorporated areas of the County. Services include law enforcement, traffic control, accident investigation, and management of hazardous materials spill incidents. The CHP has a mutual aid agreement with the Sheriff's Department and will respond when requested by the sheriff.

Service

The CHP has one office in Yuba City, which serves Sutter and Yuba Counties, as well as portions of Butte, Plumas and Sierra Counties.

The Yuba City office has 34 uniformed staff, including 29 officers, 4 sergeants, and 1 captain. The office has 15 vehicles in operation. Typical staffing has 5 units during the day shift, (2 in Sutter, 3 in Yuba) 6 units during the afternoon shift (3/3), and 2 units on the graveyard shift, one in each County.

Issues and Concerns

Currently the Yuba City office is understaffed. There are 6 vacant officer positions that have not been filled due to budget constraints at the state level. It is anticipated that some positions will be filled during 1996.

CALIFORNIA DEPARTMENT OF FISH AND GAME

The California Department of Fish and Game is responsible for the protection of wildlife resources within the County. The Department has jurisdiction over all state, county, and municipal lands to enforce wildlife statutes.

Service

The Department has 3 wardens and 1 wildlife biologist assigned to Sutter County. The regional Headquarters is located in Rancho Cordova. These staff operate out of their homes and establish their own hours, patrols, and focus for their activity. They are interconnected through the Sheriff's Department and are accessed through the Sheriff as well. The wardens generally respond only to wildlife issues but can and do respond to public safety issues if they witness such violations or situations. They will also assist in emergency situations. Most of the officers have federal wildlife enforcement capability as well.

Issues and Concerns

The primary concern for the Department is the lack of funding to provide the staffing necessary to adequately protect the wildlife resources of the county and of the state.

6.4 FIRE PROTECTION

SUTTER COUNTY FIRE SERVICES

Sutter County Fire and Emergency Services coordinates fire protection for County Service Areas C, D and F in the unincorporated portion of Sutter County covering approximately 360 square miles. In addition, Sutter County provides fire service to the City of Live Oak through a contractual agreement. The Meridian Fire Protection District covers approximately 93 square miles. The Sutter Basin Fire Protection District covers approximately 127 square miles. The Walton Fire Protection District covers approximately 24 square miles. The Meridian Fire Protection District, Sutter Basin Fire Protection District, and the Walton Fire Protection District are all independent fire districts.

ORGANIZATION

The fire services are provided through an organization of three Fire Protection Districts and three County Service Areas (Figure 6.4-1).

County Service Area "C", East Nicolaus Fire Department

County Service Area "C" was formed as a dependent district in 1963 to provide fire protection in the rural area bordered by the Bear River/Yuba County line on the north, the Feather River on the west, County Service Area "D" on the south and Placer County on the east. This area includes the communities of Nicolaus, East Nicolaus and Rio Oso. Land use in the area is predominantly agricultural. Services are provided from fire stations in East Nicolaus and Rio Oso. Staffing is provided as follows:

Station #85 (1988 Nicolaus Avenue, East Nicolaus) is a volunteer station with 4 vehicles.

Station #85-2 (176 Pleasant Grove Road, Rio Oso) is also a volunteer station with 2 vehicles.

Staffing for both stations is provided by a total of 27 volunteer firefighters.

County Service Area "D", Pleasant Grove Fire Department

County Service Area "D" was formed as a dependent district in 1963 to provide fire protection in the rural area north of the Sacramento County line, between the Feather River and Placer County. Services are provided from two stations with staffing as follows:

Station #9 (3100 Howsley Road, Pleasant Grove) is a volunteer station with 2 seasonal paid firefighters. Available equipment includes 5 vehicles.

Station #9-2 (3489 Sankey Road) is also a volunteer station. Equipment includes 4 vehicles.

Staffing for the two stations is provided by a total of up to 25 volunteer firefighters.

County Service Area "F", Live Oak, Sutter, Barry, and Bailey Fire Departments

County Service Area "F" was formed in 1996 as a result of consolidating previous County Service Area's A and B. The Service Area is a dependent district which provides fire suppression, prevention, emergency medical, rescue, and level "A" hazardous material services in the rural and urban areas of the northern portion of the County and the rural area south of Yuba City. The Service Area consists of four stations with their respective area of responsibility. Staffing is provided as follows:

Station #5 (2745 Fir Avenue, Live Oak) is a full-time station with a minimum of 1 paid firefighter 24 hours a day. There is a total of 4 paid firefighters, 2 seasonal paid firefighters and 25 volunteers assigned to the station. The station is equipped with a total of 9 vehicles.

Station #6 (2340 California Street, Sutter) is also a full-time station staffed with a paid firefighter 24 hours a day. There is a total of 4 paid firefighters, 2 seasonal paid firefighters and up to 25 volunteers. Equipment includes a total of 6 vehicles.

Station #8 (1280 Barry Road, Yuba City) is a full-time station with a paid firefighter on duty 24 hours a day. There is a total of 4 paid firefighters, 2 seasonal paid firefighters and 25 volunteers. Equipment includes a total of 5 vehicles.

Station #8-2 (8403 Bailey Road, Yuba City) is staffed with off-duty paid staff and volunteers in conjunction with Station 8. Currently available equipment includes one engine.

Meridian Fire Protection District

The Meridian Fire Protection District was formed as an independent district in 1977 to provide fire protection. It covers an area generally bounded by the Sacramento River, Tisdale Weir, the Sutter By-pass and County Service Area "F". The district includes the community of Meridian and is otherwise predominantly agricultural in land use. Services are provided from a station in Meridian with staffing as follows:

Station #65 (1100 Third Street, Meridian) is a part-time station staffed with one paid firefighter Monday through Friday during regular business hours. There is a total of 18 volunteers currently available, with the ability to staff up to 50. Available equipment includes 7 vehicles.

Sutter Basin Fire Protection District

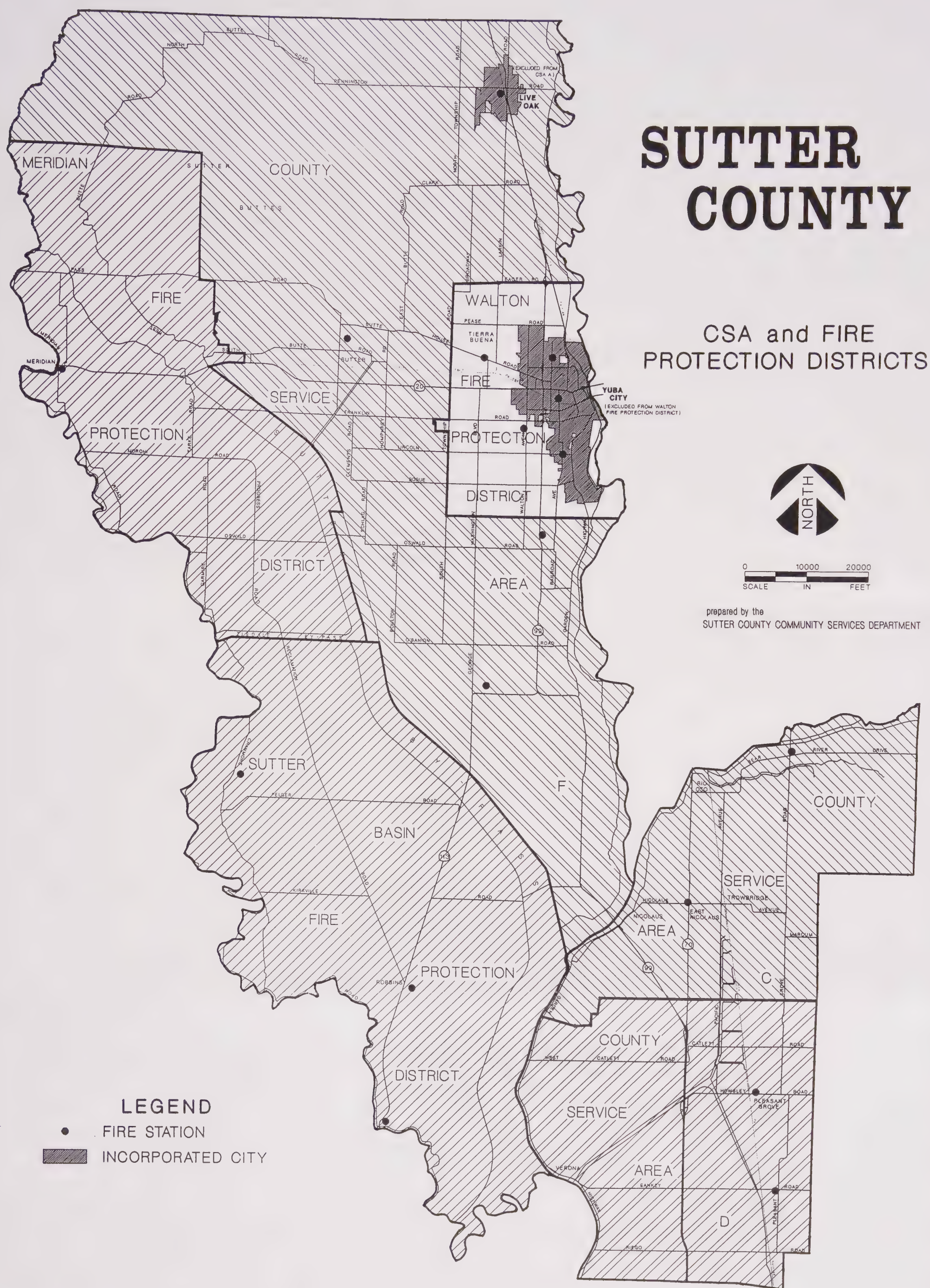
The Sutter Basin Fire Protection District was formed in 1951 to provide fire protection and protection of life. The district covers the area between the Sacramento River and the east levee of the Sutter By-Pass, south of the Tisdale Weir. Services are provided to the community of Robbins and surrounding area from several stations with the following staffing:

There are a total of 18 volunteer firefighters, with the ability to staff up to 75, within the district providing support to the following stations:

Station #1 on Pepper Street in Robbins has 3 vehicles.

Station #2 on South Knights Road near Robbins is also a volunteer station with 1 vehicle.

Station #3 on Cranmore Road is a volunteer station with 1 vehicle.



Walton Fire Protection District

The Walton Fire Protection District was formed in 1961 to provide fire and rescue services in the urban and rural areas in and around Yuba City. The District boundaries extend from Eager Road to Reed Road and from the Feather River to Township Road, exclusive of the City of Yuba City. The district has two stations with the following staffing arrangement:

Station #75 (211 South Walton Avenue, Yuba City) is a full-time station staffed 24 hours a day with a paid firefighter. Staffing includes 6 full-time firefighters. The station is equipped with a total of 8 vehicles.

Station #75-2 (2855 Butte House Road, Tierra Buena) is staffed from 8 a.m. to 5 p.m., seven days a week, with two full-time paid firefighters and is a volunteer station outside of these hours. The station is equipped with 4 vehicles.

Both stations are supported by a total of 20 volunteer fire fighters.

FIRE RATING

Insurance Services Office (ISO) ratings are assigned to different areas based on the level of fire protection provided. Most areas of the County are rated based on the following criteria:

- 4 - Areas within a 1000 foot radius of a fire hydrant.
- 8 - Dwellings outside the 1000 foot radius of a fire hydrant but within 5 miles of a fire station.
- 9 - Non-dwellings outside the 1000 foot radius of a fire hydrant but within 5 miles of a fire station.
- 10 - Areas beyond a 5 mile radius of a fire station.

Historically, the fire districts and service areas in Sutter County have met their service demands with the aid of volunteer fire personnel. The County could experience a transition in service demand associated with future growth in the unincorporated areas of the County. Sutter County is in the process of having its ISO ratings re-evaluated and it appears that the County is making progress towards improving its ratings. The Fire Services Administrator evaluates future service needs of the County and will prepare the appropriate needs assessment reports district wide for the County.

6.5 EDUCATION

Public education in Sutter County is provided by 12 local school districts. Eight local districts provide elementary education and four provide elementary and secondary education. The closest community college is Yuba College located in Marysville.

SUTTER COUNTY SUPERINTENDENT OF SCHOOLS OFFICE

The Sutter County Superintendent of Schools Office works in partnership with the California State Department of Education and the twelve school districts in Sutter County to strive for excellence in educating the students of Sutter County.

The goal of the Superintendent of Schools Office is to provide each child in Sutter County access to an appropriate educational program, regardless of special needs. The Sutter County Special Education Program, operated by the Superintendent of Schools Office, provides programs and services for disabled infant and preschool children, classes for severely and non-severely handicapped pupils, and home to school transportation for individuals with disabilities.

Through the Sutter County Superintendent of Schools Career Training and Education Center (CTEC), a broad range of vocational services are provided to eligible participants in Regional Occupational Program (ROP), Job Training Partnership Act (JTPA), Greater Avenues for Independence (GAIN), Workability, Young Mothers/Independent Study, and Community School programs.

The Tri-County ROP provides and coordinates vocational training to several thousand students from high schools in Yuba, Sutter and Colusa Counties.

Through the Educational Resource Center (ERC), operated by the Superintendent of Schools, training is offered to school personnel. Instruction in the latest state curriculum frameworks, teaching techniques, and computer use in the classroom are offered. The Woodleaf Outdoor School Program is provided to students from seven counties as a service of the ERC.

In addition to programs and services to students and teachers, the Superintendent of Schools Office also assists the twelve school districts in Sutter County to ensure solid financial management. The Superintendent of Schools Office assists the districts with budget development, fiscal advisory support, operation of data processing systems, financial reporting, and credential services.

YUBA COLLEGE

Yuba College's main campus is located on a 160-acre site outside of Marysville. Yuba College is a public community college founded in 1927. The Yuba Community College District was expanded in 1965 to include Colusa, Sutter, and Yuba Counties and then in 1975, stretched further to include parts of Glenn, Lake, and Yolo Counties. To serve this broad area, four additional satellite campuses exist: Beale Air Force Base Center, Colusa County Center, Lake County Campus, and Woodland Campus.

Yuba College offers a broad range of vocational-technical programs. There are one or two year programs as well as Associate of Arts or Associate of Science Degrees in approximately 60 career and certificate programs. A variety of support services are available. The district-wide enrollment for Fall 1995 is 10,500 students.

SUTTER COUNTY SCHOOL DISTRICTS

The local school districts range in size from 54 students in Winship Elementary District to over 10,000 students in Yuba City Unified District with 15 schools. Table 6.5-1 shows all of the districts with their current enrollment, capacity and projection figures (if available). Figure 6.5-1 shows current district boundaries and school locations for the unincorporated portions of Sutter County.

OTHER SCHOOL DISTRICTS

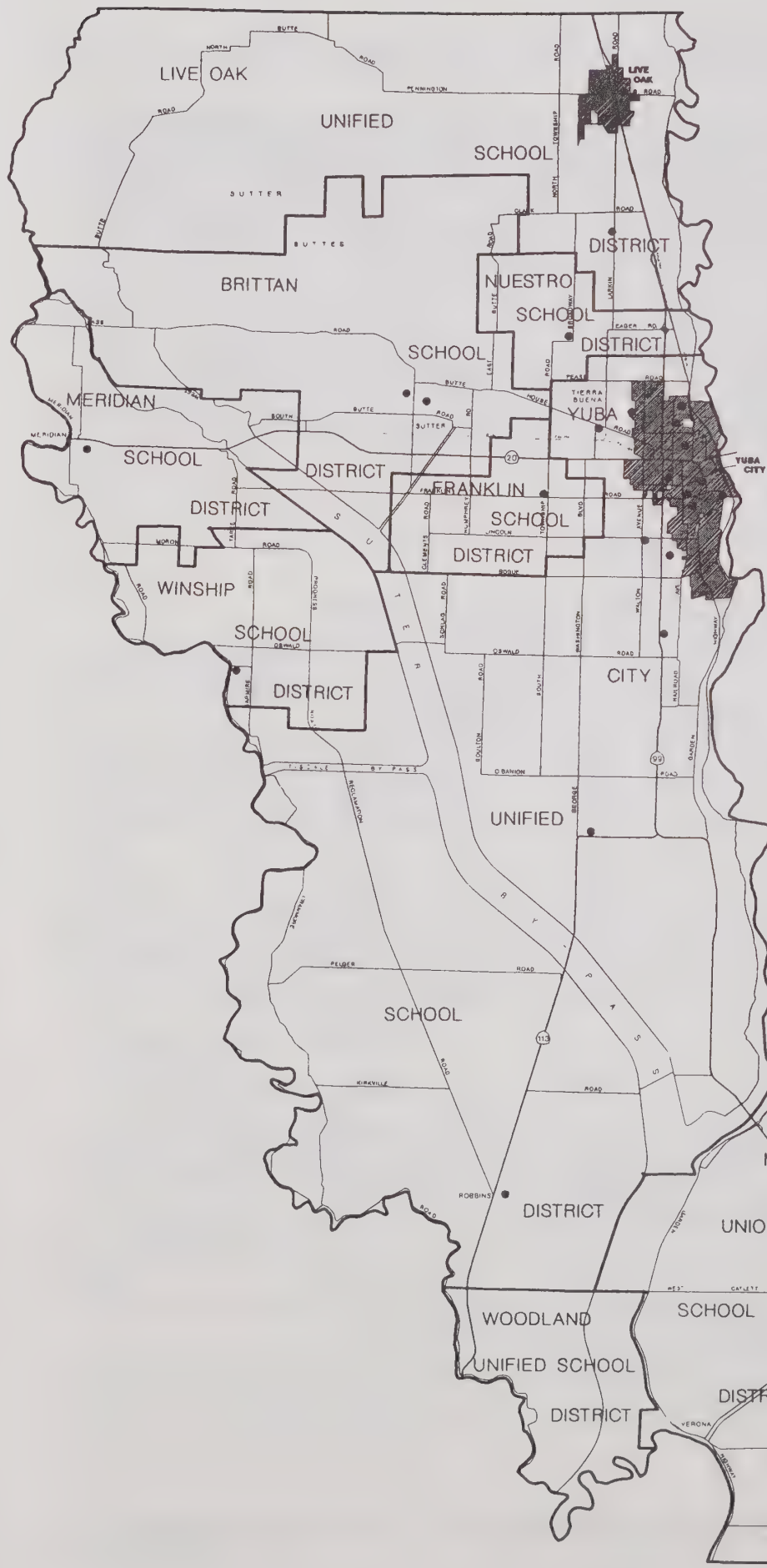
As depicted in Figure 6.5-1, a portion of the Woodland Unified School District overlaps into the southern portion of Sutter County near the community of Knights Landing at the Yolo/Sutter County border. Approximately 20 to 25 students from Sutter County attend schools in the Woodland Unified School District.

TABLE 6.5-1

SCHOOL DISTRICT ENROLLMENT FIGURES

DISTRICT BOUNDARIES	CURRENT ENROLLMENT	ENROLLMENT CAPACITY	PROJECTIONS
Brittan Elementary	643	650	830 by Year 2000
Browns Elementary	168	168	311 over 10 Years
East Nicolaus Joint Union High School	238	375	Not Available
Franklin Elementary	370	400	None
Live Oak Unified	1,709	2,326	100 - 150 Additional
Marcum-Illinois Union	136	130 - 135	54 Additional
Meridian Elementary	67	150	No Projected Growth
Nuestro Elementary	104	120	No Projected Growth
Pleasant Grove Joint Union	168	200	200 over 2 to 3 Years
Sutter Union High	510 (120 YCUSD transfers)	550	550 Less Transfers
Winship Elementary	54	70	Steady for Next 2 Years
Yuba City Unified	10,476	10,710	10,785

Source: Survey conducted by Sutter County Community Services Department, 1996.



SUTTER COUNTY

SCHOOL DISTRICTS

• SCHOOL LOCATION



0 10000 20000
SCALE IN FEET

prepared by the
SUTTER COUNTY COMMUNITY SERVICES DEPARTMENT

Figure 6.5-1
School Districts and School Locations

SCHOOL CAPACITY ISSUES

Brittan Elementary School District

Brittan Elementary School District provides elementary (K-8) education to the community of Sutter and the surrounding area. The district is approximately 63 square miles in size. Current enrollment is near capacity with 643 students. In the past two years, the school district has had to provide six additional portable classrooms to accommodate new students. Enrollment is projected to increase to 830 by the year 2000.

Browns Elementary School District

Browns Elementary School District provides elementary (K-8) education to the community of Rio Oso and surrounding area. The district is approximately 35 square miles in size. Current enrollment is 168 which is at capacity. According to the 1992 Ten Year Facilities Master Plan, the district anticipates additional demands on the school district to increase to 311 students by the 2001-2002 school year. Students attend East Nicolaus High School for their secondary education.

East Nicolaus Joint Union High School District

East Nicolaus Joint Union High School District provides secondary education to the communities of Rio Oso, Nicolaus, East Nicolaus, Trowbridge, and Pleasant Grove. The district is approximately 152 square miles in size and includes a portion of eastern Placer County. Students from Browns, Marcum-Illinois and Pleasant Grove Elementary School Districts continue to East Nicolaus High School for secondary education. Current enrollment is 238 students with a capacity of 375.

Franklin Elementary School District

Franklin Elementary School District provides elementary (K-8) education to the area west-southwest of the City of Yuba City. The district is approximately 15 square miles in size. Current enrollment is 370 students with a capacity of 400. Secondary education is provided by Sutter Union High School District.

Live Oak Unified School District

The Live Oak Unified School District provides elementary and secondary education to the City of Live Oak and the most northerly portion of unincorporated Sutter County. The district is approximately 90 square miles in size and operates five schools, Luther Elementary (K-4) with an enrollment of 690, Encinal Elementary (1-4) with an enrollment of 64, Live Oak Middle School (5-8) with an enrollment of 485, Valley Oak (Independent Study K-12) with an enrollment of 72, and Live Oak High School (9-12) with an enrollment of 398. Current district-wide enrollment is 1,709. District capacity is 2,326, but this figure includes the addition of two portable classrooms for the Luther Elementary site and the high school site.

According to the Twelve Year Master Plan Committee Report, the District anticipates the need to accommodate a 2% annual growth rate to continue for the next twelve years. The district does not support a year round school program but does anticipate the need for an additional school to be developed. The Plan recommends the development of a new high school with the current high school site being converted to the middle school. The current middle school would then become another elementary school. During the interim period the district will accommodate enrollment increases with portable classrooms.

Funding for a portion of these improvements will come from the state and developer fees, however, the need for a general obligation bond issue has been identified as the only source available to complete the recommendations.

Marcum-Illinois Union School District

The Marcum-Illinois Union School District provides elementary (K-8) education to the communities of Nicolaus, East Nicolaus, Trowbridge and Rio Ramaza. The district is approximately 61 square miles in area and operates a single school with an enrollment of 136 students. The school's capacity is 135 students. Projections estimate 54 new students over the next 10 years. Students attend East Nicolaus High School for their secondary education. If enrollment continues to rise, they will need to expand facilities.

Meridian Elementary School District

The Meridian Elementary School District provides elementary (K-8) education to the community of Meridian. The district is approximately 22 square miles in area and operates a single school with an enrollment of 87 students. Following eighth grade, Meridian students attend school at Sutter Union High School. Meridian Elementary has a capacity of 150 students and anticipates no growth in the immediate future.

Nuestro Elementary School District

Nuestro Elementary School District provides elementary (K-8) education to students from an unincorporated area between Yuba City and Live Oak. The district is approximately 11 square miles in size. Secondary education is provided by the Sutter Union High School District. Current enrollment is near capacity with 104 students. The district does not project any growth for the immediate future.

Pleasant Grove Joint Union School District

The Pleasant Grove Joint Union School District provides elementary (K-8) education to the residents of the community of Pleasant Grove and the surrounding area of southeast Sutter County as well as a portion of western Placer County. The district is approximately 56 square miles in size. Secondary education is provided by East Nicolaus Union High School District. Current enrollment is 168 students with a school capacity of 200. The district projects to be at capacity within 2 to 3 years.

Sutter Union High School District

Sutter Union High School District provides elementary and secondary education to the residents of Sutter and the surrounding area. This district includes Brittan, Franklin, Meridian, Nuestro and Winship Elementary School Districts. Total district size is 151 square miles. Current enrollment is 510 students (including approximately 120 Yuba City Unified School District transfers) with a capacity of 550. Projections are to remain at capacity with a reduction in transfers because of an expected increase in SUHSD freshmen.

Winship Elementary School District

Winship Elementary School District provides elementary (K-8) education to the residents of a 40 square mile area of western Sutter County south of the community of Meridian. Current enrollment is 54 students with a capacity of 70. Projections are steady for the next couple of years. Students are provided secondary education through the Sutter Union High School District.

Yuba City Unified School District

The Yuba City Unified School District provides elementary and secondary education to residents of Yuba City, Tierra Buena and a large area of the unincorporated county extending south to include the community of Robbins, covering an area of approximately 200 square miles. The district operates a total of 15 schools with a total enrollment of 10,476 for 1996. The February 1996 district enrollment report is included as Table 6.5-2.

The district has completed a Facilities Strategic Plan 1993-2001 that documents a brief historical perspective, recent developments, critical need areas and a summary of the report. According to the Plan, enrollment has grown 12.9% since 1989. It is anticipated that growth will continue to occur at 3% per year resulting in a 29% increase to 13,000 students by the year 2001. In order to accommodate the future demands on the system the District has prepared a Site Facilities Needs chart that is included as Table 6.5-3.

The District has adjusted to increased student enrollment through the following means:

- * Community Facilities District #1 funding
- * Developer Fees
- * Local government mitigation
- * Three multi-track year-round K-5 schools
- * Construction of an additional middle school and its multi-track year-round education program
- * Continued and increased use of portable facilities
- * Increased inter-district attendance agreements out of the District
- * Changing school boundaries

TABLE 6.5-2 - ENROLLMENT REPORT - count is from 2/9/96

SCHOOL	K	1	2	3	4	5	6	7	8	I.S.	Sub Total	Sutter County CH	Total	2/14/95 Enroll	District Calculated Capacity	Peak Enrollment County This Year	Projected Enrollment
Andros Karperos							368	322	312		1002		1002	984	810	1031	1099
April Lane	138	130	125	132	113	111					749		749	781	690	765	798
Barry	53	58	59	58	72	62	89	89	61		601	10	611	604	780	608	599
Bridge Street	93	84	78	62	76	83					476		476	495	540	496	503
Butte Vista	51	26	26	25	27	14					169	40	209	103		172	165
Central Gaither	15	15	23	19	21	22	25	24	31		195		195	225	390	212	239
Gray Avenue							262	229	245		736	9	745	720	1020	747	770
King Avenue	88	84	77	80	72	73					474		474	489	600	475	493
Lincoln	121	119	102	118	111	120					691		691	718	810	709	726
Lincrest	128	131	138	134	111	120					762	64	826	770	660	762	774
Park Avenue	138	124	102	117	120	111				27	739		739	758	690	763	782
Robbins	8	15	5	11	13	6	11	11	11		91		91	100	180	98	97
Tierra Buena	73	89	84	82	91	92	89	93	94		787		787	824	810	787	862
Alternative	3	2	9	10	5	5	9	8	20		71		71	50		80	52
Total Elementary	909	877	828	848	832	819	853	776	774	27	7543	123	7666	7621	7980	7705	7959
				9	10	11	12										
Alternative School				42	32	52	56				182		182	218		182	190
Albert Powell				0	59	86	63				208		208	180	330	222	190
YCHS				751	652	532	453				2388	32	2420	2325	2400	2543	2446
Total Secondary				793	743	670	572				2778	32	2810	2723	2730	2947	2826
Children Center	84								TOTAL		10321	155	10476	10344	10710	10652	10785
Migrant Child Care																	
Extended Day Care	76								DIFF		-23						
State Preschool	100																
Previous Report	10337																
Difference	-16																

**TABLE 6.5-3
YUBA CITY UNIFIED SCHOOL DISTRICT
SITE FACILITIES NEEDS 1994-2001**

SCHOOL	NEW FACILITIES								
	LIBRARY	M/P ROOM	K COMPLEX	MUSIC ROOM	CLASSROOMS	KITCHEN	SCHOOL OFFICE	AIR CONDITIONING	GYM
Lincoln**	NEW CONSTRUCTION 1998								
South HS**	NEW CONSTRUCTION 2001								
YCHS**								1996-1998	

SCHOOL	MODERNIZATION OF EXISTING FACILITIES									
	RESTROOMS	FIELDS/ GROUNDS	CLASSROOMS	KITCHEN	GYM	PARKING	HEATING SYSTEM	WATER/GAS	POWER	MP ROOM
Lincoln**										
South HS**										
YCHS**	MODERNIZATION 1997									

Dates indicate project completion.

Two ** indicates projects that cannot be done without a bond issue.

The Plan also identifies some "Critical Needs" projects that should be established among the highest priority of resources. These are as follows:

- * Lincoln School - New site and facilities.
- * South High School - Construction of new school.
- * Yuba City High School - Modernization.

A critical element in achieving the proposed improvements is the funding levels and sources. The biggest uncertainty in seeing the plan implemented is the necessity to conduct a successful bond election.

Issues and Concerns

A number of school districts within Sutter County have seen significant increases in enrollment over the last several years. During this same period the funding for school programs has decreased. This situation is expected to continue in the foreseeable future. In fact, the California Department of Finance projects that Sutter County will experience a 39.3% increase in total K-12 enrollment between 1992 and 2002.

6.6 UTILITY SERVICE COMPANIES

ELECTRIC AND GAS

PG&E provides electrical and natural gas service to Sutter County. Electrical service is provided to all areas of the County. Natural gas service is provided only to the urbanized areas of Yuba City and Live Oak, and to the community of Nicolaus.

Most of the electrical service in the County is carried through above-ground lines. However, new urban development is now typically served by underground service. In addition, PG&E maintains a program to underground existing service lines.

Sutter County is crossed and served by two general types of Transmission lines: a 500 kV line that is part of the Pacific Intertie System and a series of 60-230 kV lines that serve the local needs of the County. The reader is referred to Chapter 11 of this report for the general location of transmission lines and substations.

In addition the County is crossed by gas transmission lines. These lines transport gas from local wells in the western portion of the County as well as gas that is imported from outside California. The reader is referred to Chapter 11 of this report for the general location of gas transmission facilities.

Issues And Concerns

PG&E currently has sufficient energy supplies and distribution facilities to meet anticipated demands. They anticipate upgrading existing substations over the next five years to improve the performance of the system.

TELEPHONE

Pacific Bell provides telephone service for the entire County. The main office is located in Sacramento.

Service

Currently, most of the Pacific Bell service lines within the County are above ground. Underground service has become more common for new projects, in or adjacent to, developed areas of the County. Pacific Bell participates in a joint undergrounding program with PG&E and has been incrementally undergrounding service in the urban areas of the County.

Issues and Concerns

Pacific Bell has adequate service to meet the anticipated demands within the County.

CABLE TELEVISION

There are two cable television providers in Sutter County, Continental Cablevision and the South Sutter Cable Company. General service areas have been established for these two companies by the County. The franchises are non-exclusive. Continental Cable is based in Yuba City and serves the Yuba City Urban Area including Tierra Buena, the Live Oak Urban Area, and the community of Sutter. The South Sutter Cable Company does not provide any service at this time, but was created to provide cable service in the southern portions of the County.

In existing developed areas, cable service runs on above-ground lines. All new urban development is served by underground service. The company currently maintains 274 miles of cable in Sutter County.

Issues and Concerns

At the present time, the only constraint to providing cable television service within the County is the rural settlement pattern which exists in the majority of the County. It is not cost effective to install cable service unless there are approximately 25 houses per mile.

6.7 SPECIAL DISTRICTS

Sutter County currently has 54 special districts that provide various public services for areas within their respective service areas. Table 6.7-1 briefly summarizes 10 different types of special districts providing service within Sutter County. Figures 6.7-1 through 6.7-4 show the Sutter County locations for: California Water Districts, Community Service Districts, Levee and Reclamation Districts, and Drainage Districts. (See Figure 6.4-1 for County Service Areas and Fire Protection Districts.)

TABLE 6.7-1
SPECIAL DISTRICTS

CALIFORNIA WATER DISTRICTS			
DISTRICT	INDEPENDENT	SERVICE	NOTE
Butte	Yes	Agricultural water supply and drainage	Butte County is principal county.
Biggs/West Gridley	Yes	Irrigation water	Serves approximately 1,000 acres in north Sutter County.
Feather	Yes	Agricultural water supply and drainage	
Oswald	Yes	Agricultural water supply and drainage	
Pleasant Grove	Yes	Domestic water and drainage	Formed in 1992 to serve South Sutter County Urban Area.
Sutter Extension	Yes	Agricultural water supply and drainage	
South Sutter	Yes	Agricultural water supply and drainage	

COMMUNITY SERVICES DISTRICTS			
DISTRICT	INDEPENDENT	SERVICE	NOTE
Pleasant Grove	Yes	Full urban services except for police	Formed in 1992 to serve the South Sutter County Urban Area. Not providing services yet.
Rio Ramaza	No	Domestic water and sanitary sewer service	Serves Rio Ramaza Mobilehome Park.
Sutter	Yes	Domestic water	Serves the community of Sutter.
Tierra Buena	No	Sanitary sewer	Formed in 1992 to provide sanitary sewer service to the Stonegate Subdivision.

TABLE 6.7-1 CON'T.

COUNTY DRAINAGE DISTRICTS			
DISTRICT	INDEPENDENT	SERVICE	NOTE
El Cerrito	No	Drainage	
El Margarita	No	Drainage	
Gilsizer	Yes	Drainage	District board composed of members of Board of Supervisors and Yuba City Council.
Tierra Buena	No	Drainage	Inactive.

COUNTY SERVICE AREAS			
DISTRICT	INDEPENDENT	SERVICE	NOTE
C	No	Fire	East Nicolaus Fire Department.
D	No	Fire	Pleasant Grove Fire Department.
E	No	Drainage	Inactive.
F	No	Fire	Provides fire service to the community of Sutter and nearby unincorporated areas. By contract, serves the City of Live Oak. The Oswald Tudor Fire Department is included in this district.

TABLE 6.7-1 CON'T.

FIRE PROTECTION DISTRICTS			
DISTRICT	INDEPENDENT	SERVICE	NOTE
Meridian	Yes	Fire	Provides fire service to the community of Meridian and nearby unincorporated areas.
Sutter Basin	Yes	Fire	Provides fire service within the Sutter Basin area.
Walton	Yes	Fire	Provides fire service to the unincorporated area within the Yuba City Urban Area.

MOSQUITO ABATEMENT DISTRICTS			
DISTRICT	INDEPENDENT	SERVICE	NOTE
Colusa	Yes	Mosquito abatement	Primarily located in Colusa County but also serves the Butte Sink area in Sutter County.
Sutter-Yuba	Yes	Mosquito abatement	Serves the majority of the valley floor areas of Sutter and Yuba Counties.

PUBLIC CEMETERY DISTRICTS			
DISTRICT	INDEPENDENT	SERVICE	NOTE
Fairview	Yes	Public cemetery	
Live Oak	Yes	Public cemetery	
Meridian	Yes	Public cemetery	
Nicolaus	Yes	Public cemetery	
Pleasant Grove	Yes	Public cemetery	
Sutter	Yes	Public cemetery	

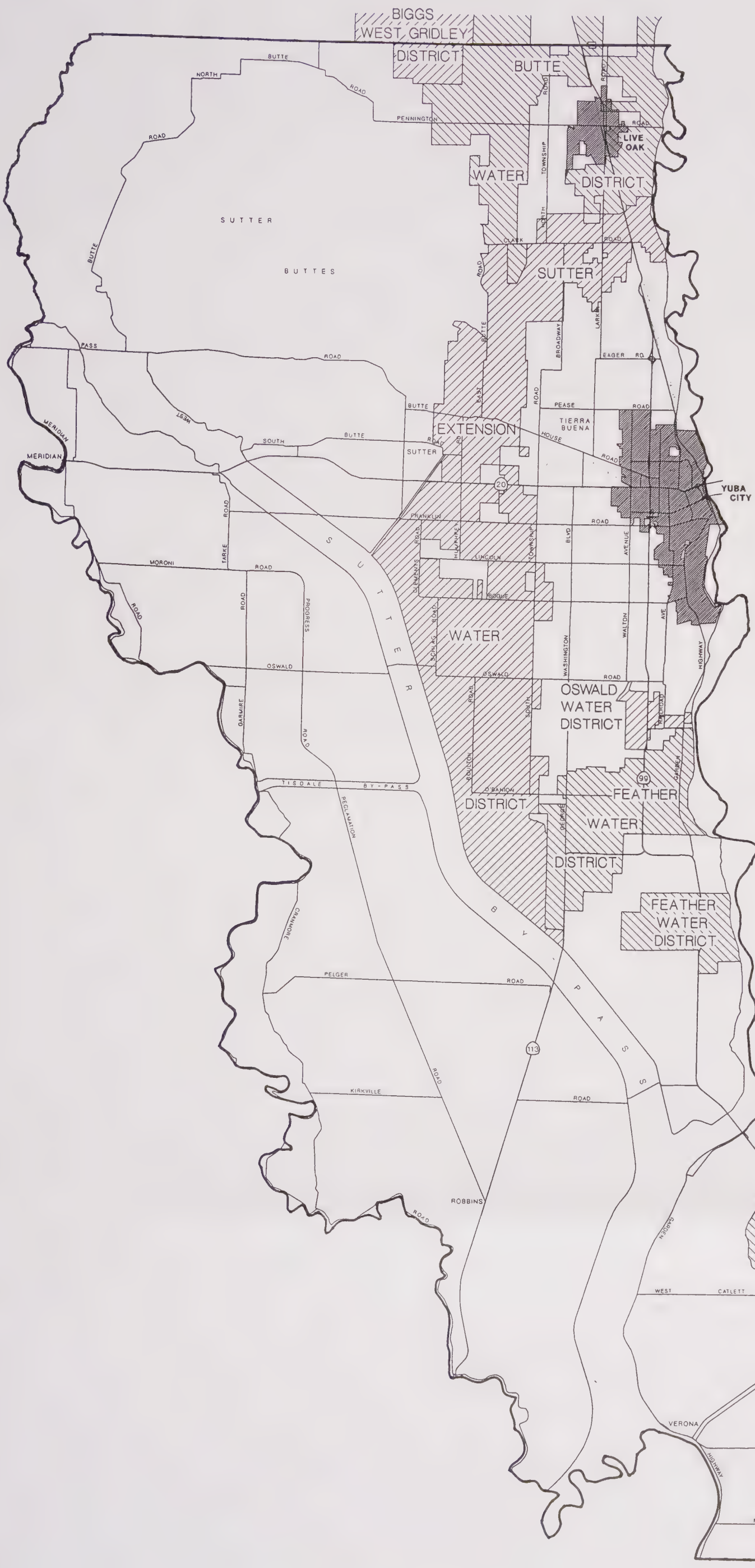
TABLE 6.7-1 CON'T.

RECLAMATION DISTRICTS			
DISTRICT	INDEPENDENT	SERVICE	NOTE
70	Yes	Storm drainage, reclamation and levee maintenance.	
777	Yes	Storm drainage, reclamation and levee maintenance.	
783	Yes		Reactivated in 1994 for drainage and reclamation.
803	Yes		Inactive.
817	Yes	Storm drainage, reclamation and levee maintenance.	Yuba County is principal county.
819	Yes		Inactive.
823	Yes		Inactive.
1000	Yes	Storm drainage, reclamation and levee maintenance.	Sacramento County is principal county.
1001	Yes	Storm drainage, reclamation and levee maintenance.	
1004	Yes	Storm drainage, reclamation and levee maintenance.	Colusa County is principal county.
1500	Yes	Storm drainage, reclamation and levee maintenance.	
1660	Yes	Storm drainage, reclamation and levee maintenance.	
2054	Yes	Storm drainage, reclamation and levee maintenance.	
2056	Yes	Storm drainage, reclamation and levee maintenance.	
2103	Yes	Storm drainage, reclamation and levee maintenance.	Yuba County is principal county.

TABLE 6.7-1 CON'T.

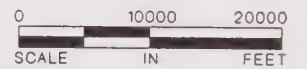
LEEVE DISTRICTS			
DISTRICT	INDEPENDENT	SERVICE	NOTE
1	Yes	Levee maintenance	
9	No	Levee maintenance	

MISCELLANEOUS DISTRICTS			
DISTRICT	INDEPENDENT	SERVICE	NOTE
Feather River Air Quality Management	No	Air pollution control	Bi-County agency regulating air quality requirements.
Robbins Water Works	No	Domestic water and sanitary sewer service	Formed in 1986 to provide domestic water to the community of Robbins. Services expanded in 1992 to provide for sanitary sewer service.
Sutter County Flood Control and Water Conservation	No	Flood improvement planning	
Sutter County Resources Conservation	Yes	Soil and water conservation	County-wide agency
Sutter County Water Agency	No	Flood control and drainage	County-wide agency with authority to act in all matters pertaining to water; e.g., drainage, irrigation, domestic, etc.
Tisdale	Yes	Irrigation water	



SUTTER COUNTY

WATER DISTRICTS



prepared by the
SUTTER COUNTY COMMUNITY SERVICES DEPARTMENT

NOTE: As indicated by this map, some district boundaries extend into other counties outside of Sutter County.

Figure 6.7-1
Water Districts



SUTTER COUNTY

COMMUNITY SERVICE DISTRICTS



0 10000 20000
SCALE IN FEET

prepared by the
SUTTER COUNTY COMMUNITY SERVICES DEPARTMENT

Figure 6.7-2
Community Service Districts

This map illustrates the geographical layout of Butte County, California. Key features include:

- Road Network:** Major roads are labeled, such as RD 70, RD 1660, RD 1500, RD 823, RD 783, RD 2054, RD 2066, RD 777, and RD 1004.
- Towns and Cities:** Locations like Yuba City, Marysville, and Verdi are marked.
- Geographical Features:** The map shows the county's irregular borders and its position relative to neighboring areas.



NOTE. As indicated by this map, some district boundaries extend into other counties outside of Sutter County.

Figure 6.7-3
Levee and Reclamation Districts

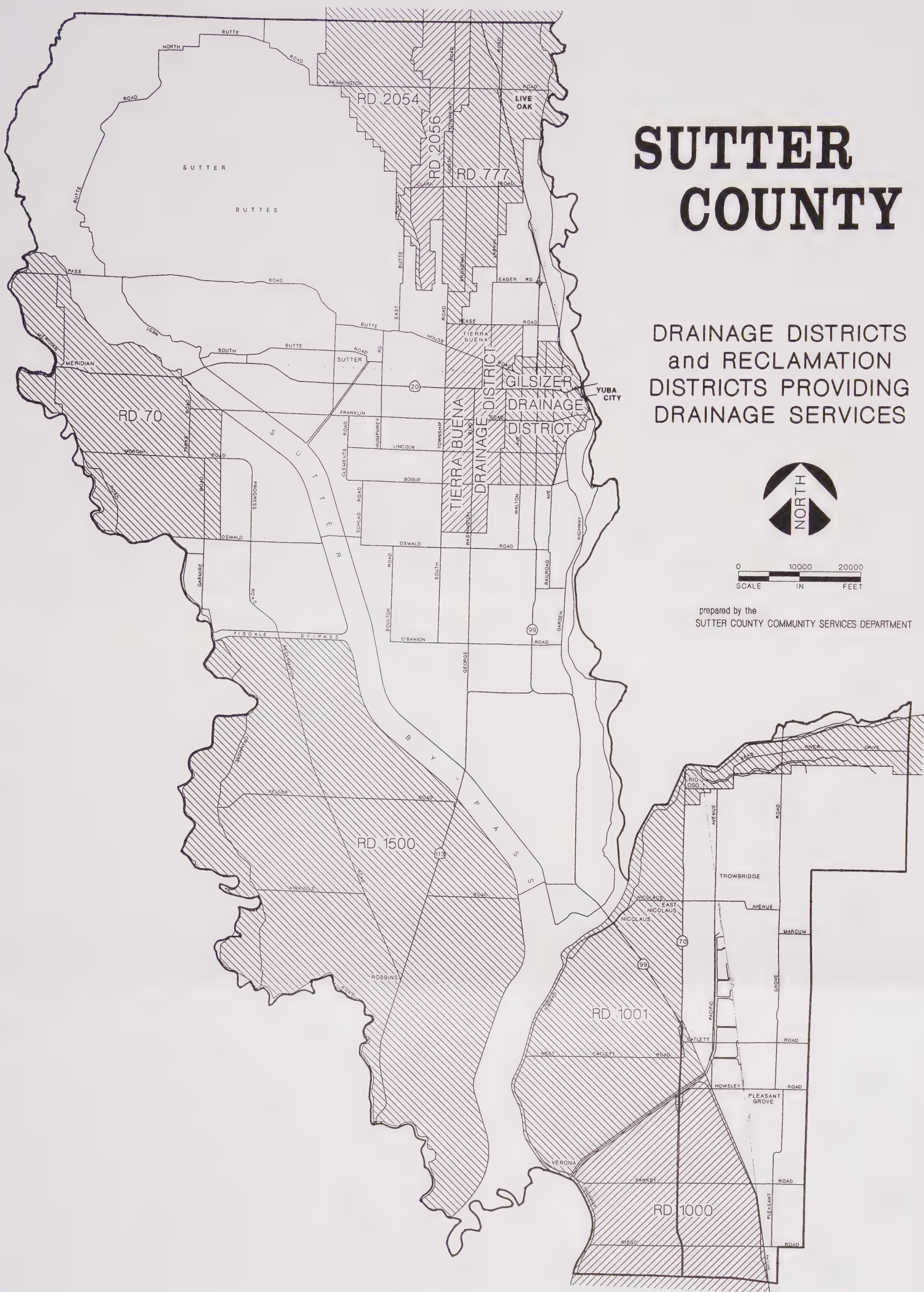


Figure 6.7-4
Drainage Agencies

6.8 FINDINGS

- The major issue facing the Sutter County Sheriff's Department is filling and maintaining an adequate number of sworn positions in the department to meet desired service levels.

Education

Schools

- In addition to the significant increase in enrollment in the past several years, a 39.3% increase in K-12 enrollment is expected for Sutter County between 1992 and 2002.
- Several school districts in Sutter County are at or near capacity. The largest district (Yuba City Unified) has resorted to the use of portable classroom facilities, school impact fees, and year-round academic schedules, among other measures, as a solution to the chronic lack of classroom space and increased enrollment.

Fire Protection

- The current fire protection levels of service are adequate to meet the County's existing needs. However, future growth in the County will require a re-evaluation of service needs.

Utility Service Companies

- PG&E has adequate gas and electric supplies and facilities to meet short-term demands. They have plans to upgrade various substations to improve their electric services in the County.
- Pacific Bell has adequate services to meet anticipated demands within the County.
- The only constraint to providing cable service is low density development patterns in the rural portions of the County.

6.9 PERSONS CONSULTED

Fire Protection

Hinton, Earl, Fire Equipment Operator. Meridian Fire Protection District

Johner, Mike, Fire Chief. Walton Fire Protection District

Kraus, Gary, Fire Services Administrator. Sutter County

Education

Barton, Normalee, Secretary. Grafton Elementary School

Brittenham, Lee, Superintendent. Yuba City Unified School District

Conley, Evelyn, Secretary. Lee Jr. High School

Heape, Joe, Director of Facility and Support Services. Live Oak Unified School District

Hill, Sam, Superintendent. Live Oak Unified School District

Hubbard, Susanna. Sutter County Superintendent of Schools Office

Prange, William, Principal. Meridian Elementary School

Root, Miriam, Public Relations Director. Yuba College

Cable Television

Adams, Rick, Technical Supervisor. Continental Cable Television

Law Enforcement

Denny, Jim, Undersheriff. Sutter County Sheriffs Department

Manies, Ken, Officer. California Highway Patrol

Whitmore, Dale, Biologist. California Department of Fish and Game

Utility Service Companies

Bartolome, Art. Pacific Gas and Electric

Kirchaval, Melody. Pacific Gas and Electric

Roady, J.P., Engineer. Pacific Bell

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CHAPTER 7

RECREATION

7.1 INTRODUCTION

This chapter describes existing park and recreation opportunities within Sutter County, proposed facilities and an inventory of historic sites.

Recreation can be an active or passive use of unimproved open space land or improved recreational facilities. Wildlife areas, areas of scenic, historic and cultural value, lake shores, beaches, and rivers and streams are all examples of open space as a passive use which may have few or no improvements. Parks, golf courses, and sports clubs are all examples of recreation areas that provide for more active uses and have more facility improvements.

7.2 REGIONAL OVERVIEW

Sutter County encompasses approximately 607 square miles (388,358 acres) and is divided into two topographic regions: the very flat Sacramento Valley, which comprises 87 percent of the county and has elevations generally ranging from 20 feet to 80 feet; and the Sutter Buttes, comprising 13 percent of the county (78.54 square miles) with elevations from approximately 80 feet to 2,117 feet. Sutter County does not have a large variety of diverse landforms; however, its primary feature, the Sutter Buttes, is a significant landform visible from most every corner of the county and as well as surrounding jurisdictions.

County-wide, there are a number of areas under public ownership, providing recreational opportunities for those who choose to use them. Private recreational lands and facilities are also found in the County. Highways 99 and 20 provide access to recreation spots for visitors and County residents.

Between 1980 and 1995, total Sutter County population grew from 52,246 to 74,932, a gain of 43.42 percent. Of this growth 4,871 persons or 21.47 percent of the total growth, resided in unincorporated Sutter County. From all indications, unincorporated Sutter County will continue to grow at a relatively slow but steady rate. This growth has the potential to impact the quality of life of Sutter County residents unless steps are taken to balance the demands of a growing population with the need to retain and protect the natural, cultural, and intangible aesthetic resources and environmental qualities which contribute to the quality of life. The County currently has a program which calls for the development of a parks and recreation master plan. It is anticipated that this plan will evaluate current recreational opportunities in Sutter County, and identify methods of improving and/or expanding these opportunities.

7.3 REGIONAL, COMMUNITY AND NEIGHBORHOOD PARKS

PARKS AND RECREATION SERVICE AREAS

Sutter County does not have a park and recreation department and does not provide recreational facilities or opportunities through County programs under such a public agency. A variety of parks and recreation opportunities are located in the unincorporated area; however, there are no county park and recreation districts which serve the unincorporated area. Though not established to function as park districts, five "quadrants" have been established in the unincorporated urban area. Money for parks is collected through developer impact fees as new development occurs and is then used within the quadrant it was collected to develop new parks after forming a park assessment district. Currently, the County has two park assessment boundaries.

The Board of Supervisor's established a Parks and Recreation Advisory Commission to: 1) advise the Board as to those policies and practices which offer opportunities for a full range of recreational activities; 2) encourage development of natural resource areas for recreational activities; 3) make recommendations for coordinated regional processes for park and recreational planning, acquisition, funding, and development; 4) encourage the planned development of parkways, bike paths, off-road vehicle travel areas, wildlife preserves, picnic and camping facilities, and special facilities accommodating such leisure-time activities as golf, zoological attractions, historical areas, arboretums, and similar facilities; 5) make recommendations on the development of future park and recreation capital improvement programs and the assignment of priority ratings thereto with the classifications: urgent projects, necessary projects, desirable projects, and deferrable projects; 6) recommend policy positions to the Board of Supervisors on pending legislation affecting county park and recreation systems and its policies and procedures; and 7) continually review, evaluate, and recommend updates of the County's Park and Recreation Element of its General Plan. Each of the five Supervisors appoints one member of the Commission to serve at the pleasure of their respective Supervisor.

The Public Works Department provides staff assistance to the Parks and Recreation Commission in coordination with other departments and prepares a monthly Commission agenda. County Park maintenance is managed by the Public Works Department. Maintenance is limited to mowing grass and repairing damaged facilities. In a quadrant with a park assessment boundary, park maintenance may be expanded to include replacement and/or purchase of new park equipment and the replacement and/or purchase of new vegetation when necessary.

The City of Yuba City has a Parks and Recreation Department. The City of Live Oak does not have a formally established Parks and Recreation Department but the City has attempted to establish several recreational opportunities within its jurisdiction. The existing neighborhood parks, school parks, community parks, regional parks and specialized recreation areas are described below for each city and unincorporated Sutter County.

Yuba City Parks and Recreation Department

The Yuba City Park and Recreation Department includes all of the incorporated Yuba City area. The Department's area encompasses approximately 8.84 square miles and is characterized by the greatest population concentration with 45.8 percent of Sutter County's total population within its boundaries. The City's Park Department represents the most predominant Department in the County in terms of parklands and facilities. The Department operates and maintains a full complement of park and recreation area settings. It also operates an extensive program that includes a variety of athletic, education, crafts, and senior programs. The Department can be expanded to accommodate future population growth. Part of future expansion plans include a community center in the Town Center Specific Plan which could be utilized by the Parks and Recreation Department as a recreation facility. The Department operates under a Comprehensive Park and Recreation Plan adopted in October 1989. Table 7.3-1 lists existing facilities in the area and their locations and sizes. Facilities are grouped in the following general categories: regional parks, community parks, neighborhood parks, and other facilities such as school-parks.

TABLE 7.3-1

YUBA CITY PARKS AND RECREATION DISTRICT FACILITIES

REGIONAL PARKS

No regional parks are located in the Yuba City Parks and Recreation District.

COMMUNITY PARKS

Blackburn-Talley Park

Location: East side of Garden Highway, at Burns Drive
Size: 14.45 acres
Facilities: Two softball diamonds, night lighting, bleachers, two full basketball courts, restrooms, concession stand, playground equipment and picnic areas.

Gauche Park

Location: "C" Street at Emerson Way, adjacent to Yuba-Sutter Fairgrounds
Size: 6 acres
Facilities: Softball field, bleachers, restrooms, picnic areas, horseshoe pits, playground equipment.

Sam Brannan Park

Location: Adjacent to Gray Avenue Intermediate School
Size: 8 acres
Facilities: Swimming and diving pool, wading pool, dressing room facilities and paved parking lot, four lighted tennis courts, one large group picnic area and three small group or individual family picnic areas, children's playground, horse shoe pits, restrooms.

NEIGHBORHOOD PARKS

Bogue Park (tentative name)

Location: Bogue Road
Size: 4.4 acres
Facilities: Passive recreation area with proposed playground equipment

Clark-Ainsley Mini Park

Location: Clark and Ainsley
Size: .07 acres
Facilities: Passive recreation area.

Greenwood Park

Location: Greenwood Way and Coats Drive
Size: 5.5 acres
Facilities: Playground equipment, night lighting, open play area, picnic areas.

Hillcrest Park

Location: Between Railroad Avenue and Bunce Road
Size: 5 acres
Facilities: Playground equipment, passive area.

Kingwood Park

Location: Gray Avenue south of Charlotte Avenue
Size: 4.5 acres
Facilities: Playground equipment, open play area.

Lloyd Park

Location: North of Bridge Street on Fippins Avenue, Jones Street, and Hughes Avenue
Size: 1.6 acres
Facilities: Passive area, playground equipment.

Maple Park

Location: South of Ainsley Avenue, on Maple and Orange Streets.
Size: 1.1 acres
Facilities: Playground equipment, passive area.

Moore Park

Location: Bridge Street and Cooper Avenue
Size: .5 acres
Facilities: Playground equipment.

Nason Park

Location: At King Avenue Elementary School, King Avenue
Size: 6 acres
Facilities: Two unlighted softball fields, picnic area, playground equipment.

North Ridge Park (tentative name)

Location: East side of Clark Avenue at North Ridge Drive
Size: 4.4 acres
Facilities: Proposed playground equipment, passive recreation area.

Orchard Manor Park

Location: Queens Avenue and Upland Drive
Size: .3 acres
Facilities: Playground equipment area.

Plumas Street Mini Plaza

Location: Plumas Street between Reeves Avenue and Fremont Way
Size: .16 acre
Facilities: Passive recreation area.

Southside Park

Location: Wilbur Avenue between Moore and Wilson Avenues
Size: .65 acres
Facilities: Playground equipment.

Veteran's Park

Location: Bridge and Second Streets
Size: .1 acre
Facilities: Passive recreation area.

OTHER RECREATION FACILITIES

April Lane Elementary School

Location: April Lane and Winslow Drive
Facilities: Multi-purpose room with stage, basketball hoops, physical fitness equipment, playground equipment, paved game area, passive area.

Bridge Street Elementary School

Location: 500 Bridge Street, corner of Bridge and Plumas Streets
Facilities: Media Center for meetings and books, basketball hoops, paved game area, physical fitness equipment, playground equipment.

Gray Avenue Intermediate School

Location: 808 Gray Avenue
Facilities: Medium sized multi-purpose room with stage and basketball standards, paved game area, athletic field, playfield area.

King Avenue School

Location: 600 King Avenue
Facilities: Medium sized multi-purpose room, paved game area, basketball hoops, playground equipment.

Yuba City High School

Location: Clark Avenue between B Street and Franklin Avenue
Facilities: Men's Gym, Women's Gym, field house, multi-purpose room with stage, paved game area, multi-purpose athletic field, three baseball diamonds, eight tennis courts, lighted stadium with football field and track.

Live Oak Parks and Recreation

The City of Live Oak does not have a Parks and Recreation Department and provides limited recreational facilities and programs. The City has established some recreation programs for swimming, softball and volleyball activities. The school sites provide play areas in addition to the neighborhood parks. Table 7.3-2 lists the Live Oak area parks and neighborhood parks.

TABLE 7.3-2

LIVE OAK PARKS AND RECREATION FACILITIES

Live Oak City Park

Location: Park and D Streets
Size: 20.5 acres
Facilities: Community Center, City Pool, 4 Little League Fields, playground equipment, picnic facilities, barbeque area

Date Street Park

Location: Date and P Streets
Size: .65 acres

Larkin & Pennington Park

Location: Southwest corner Larkin and Pennington Roads
Size: .34 acres

Unincorporated Sutter County

A special park and recreation district does not exist to serve the unincorporated areas of Sutter County. 62.9 percent of all unincorporated county residents reside in the Yuba City Urban Area (this figure excludes the City of Yuba City) and utilize the Yuba City Parks and Recreation Department services. As stated earlier in this chapter, the County has established two park assessment boundaries in the urban area, one of which is used to maintain West Walton Park and the second formed to fund the construction and maintenance of Happy Park. Table 7.3-3 lists the unincorporated Sutter County parks and other public recreational facilities, their locations and sizes. Figure 7.3-1 shows the location of unincorporated County park facilities.

TABLE 7.3-3

UNINCORPORATED SUTTER COUNTY PARK FACILITIES

NEIGHBORHOOD PARKS

Happy Park

Location: Pebble Beach Drive west of Walton Avenue
Size: 6.8 acres
Facilities: Proposed playground area with equipment for tots and older youths to be constructed in 1996; passive recreation.

Harter Park

Location: Butte House Road behind the County Museum
Size: 4 acres
Facilities: Grass only, no facilities.

Holly Tree Park

Location: Parkview off of Manzanita Way
Size: 3.6 acres
Facilities: Grass only, no facilities.

West Walton Park

Location: Pelican Place, west of Andros Karperos School
Size: 5.7 acres
Facilities: Playground equipment, picnic areas, passive recreation, basketball hoops.

RIVER PARKS

Boyd's Pump

Location: On the Feather River, off of Garden Highway at boat ramp sign, closest cross street is Oswald Avenue.
Facilities: Boat ramp, paved parking.

Donahue Road Park

Location: Donahue Road and Cranmore Road (levee) on the Sacramento River
Facilities: None, except for shoulder parking and trash can; primitive camping for up to 72 hours.

Live Oak Park and Recreation Area

Location: East Pennington Road on the Feather River
Facilities: Picnic areas, overnight parking, boat ramp, restrooms, campsites.

Tisdale Boat Ramp

Location: Garmire Road at levee on the Sacramento River
Facilities: Boat ramp, paved parking, restrooms.

Shanghai Bend

Location: East end of Shanghai Bend Road on the Feather River
Facilities: Restrooms, river access, paved parking.

Yuba City Boat Ramp and Mosquito Beach

Location: Over levee at 2nd Street (near airport) on the Feather River
Facilities: Picnic area, boat ramp, parking area.

OTHER RECREATION FACILITIES

Marinas

Joe's Place

Location: South of Cross Canal at Sankey Road, along the Sacramento River
Size: 5 acres
Facilities: Boat launch ramp, river docks, small RV campground, restaurant.

Lovey's Landing

Location: 2.7 miles north of Meridian on the Levee Road along the Sacramento River
Size: 1.89 acres
Facilities: Boat launch ramp, small RV campground, store, river docks, restaurant.

Rio Ramaza

Location: Garden Highway north of Riego Road along the Sacramento River
Facilities: Boat launch ramp and river docks.

Verona Marina

Location: Garden Highway at Vernon Road, along the Sacramento River
Size: 6.6 acres
Facilities: Boat launch ramp, picnic area, and RV campground.

Private Camping and Recreational Vehicle Facilities

Lake Minden

Location: Marcum Road at Powerline Road south of Nicolaus
Size: 157 acres
Facilities: Private RV facility with 263 sites, man made lake.

Golf Courses

Mallard Lake Golf Course

Location: Highway 99, south of Oswald Road
Size: 41 acres
Facilities: Privately owned 9-hole public golf course, driving range, miniature golf course.

South Ridge Golf Course

Location: South Butte Road, west of Wyncoop Road
Size: 200+/- acres
Facilities: Privately owned 18-hole golf course and country club.

The Oaks Golf Course (under construction)

Location: Approximately 1½ miles southwest of the rural community of Nicolaus, south of Lee Road and east of Garden Highway
Size: 135+/- acres
Facilities: Proposed facilities include a privately owned 18-hole golf course, driving range, club house, swimming pool and tennis courts.

Other Facilities

Sutter Community Center

Location: Corner of Butte House Road and Acacia Street
Facilities: Community center, Little League Field with bleachers.

East Nicolaus Little League Field

Location: East Nicolaus
Facilities: Little League Field

Peach Bowl Little League Field

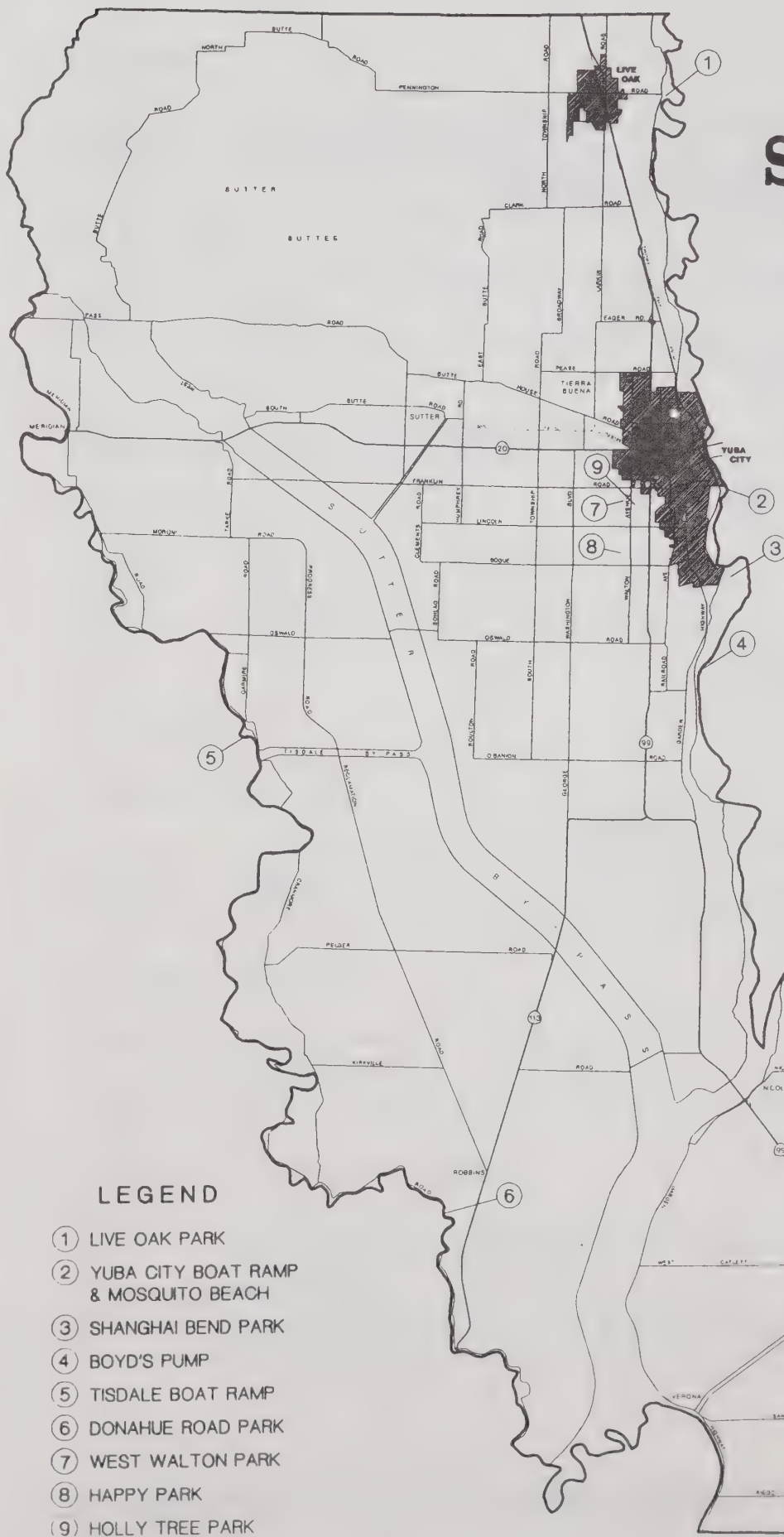
Location: Second Street in Yuba City
Facilities: Little League Field

Sutter County Rifle Range

Location: Second Street in Yuba City
Facilities: Outdoor shooting range

Yuba/Sutter Fairgrounds

Location: Franklin Avenue at Garden Highway
Facilities: Exhibit halls, livestock pens, restrooms



SUTTER COUNTY

COUNTY PARK FACILITIES



0 10000 20000
SCALE IN FEET

prepared by the
SUTTER COUNTY COMMUNITY SERVICES DEPARTMENT

LEGEND

- ① LIVE OAK PARK
- ② YUBA CITY BOAT RAMP & MOSQUITO BEACH
- ③ SHANGHAI BEND PARK
- ④ BOYD'S PUMP
- ⑤ TISDALE BOAT RAMP
- ⑥ DONAHUE ROAD PARK
- ⑦ WEST WALTON PARK
- ⑧ HAPPY PARK
- ⑨ HOLLY TREE PARK

Figure 7.3-1
Park Facilities

7.4 HISTORICAL SITES AND LANDMARKS

Sutter County contains two registered California Historical Landmarks and several points of historical interest. Table 7.4-1 lists the two Historical Landmarks in Sutter County. No National Register of Historic Landmarks exist within the County's boundaries.

TABLE 7.4-1

CALIFORNIA HISTORICAL LANDMARKS

Sutter Hock Farm

Established in 1841 by John Augustus Sutter after settling at Sutter's Fort. He created the first important agricultural project in this part of the state and planted grapes, pomegranates, fig trees and the first peach orchard on his land at Hock Farm as well as using it as a stock ranch.

Site of Propagation of the Thompson Seedless Grape

Commemorates the location where the Thompson seedless grape was developed.

Historic Sites and Points of Historic Interest

Table 7.4-2 contains a list of sites (1-78) developed by the Sutter County Historical Society, which have historical or cultural significance to Sutter County. Those sites marked with an asterisk are recognized as Points of Historic Interest in Sutter County by the California Department of Parks and Recreation Office of Historic Preservation. Each site on the list is numbered and corresponds to a like number on the location map (Figure 7.4-1).

TABLE 7.4-2

HISTORIC SITES

- 1*. 774 B Street - E.G. Van Arsdale House built about 1880. Van Arsdale was an early Second Street merchant.

- 2*. 819 Shasta Street - A.C. McLaughlin Law Office relocated in 1953 from its original location across from the courthouse. It was a law office for A.C. McLaughlin and Justice of the Peace office for Judge Hugh D. Moncur and courtroom for the Justice and Municipal Courts.
- 3*. 442 B Street - Sutter County Canning/Packing Company.
- 4*. 334 C Street - The Stabler-Swinson House built in 1862. The R.C. Kells lived there from 1887 to 1899. Bennett Shilling lived there in 1902.
- 5*. 241 C Street - Butler House was built in 1973. It was owned later by Judge Coats and by Lewis Duncan, a former Yuba City Police Chief and City Clerk.
- 6*. 212 C Street - Old Harkey House built about 1870. Harkey was an early sheriff of Sutter County. The house later became the residence of Sid Smith. It is currently being used as a "bed and breakfast" facility.
- 7*. 500 2nd Street - Sanborn Law Office built in 1870. Mr. Sanborn, Lawrence Shillig and D.A. Winship practiced law in this office. The original wooden walls were covered by stucco in 1906. In 1908, Yuba City was incorporated as a city in this building.
- 8*. 446 2nd Street - Sutter County Courthouse built in 1871 on the site of the 1858 courthouse which burned. In 1899, it was rebuilt with only minor architectural changes after another fire.
- 9*. 446 2nd Street - Sutter County Hall of Records.
- 10*. 423 2nd Street - Thomas D. Boyd House built about 1869. It was known as the Clark House in the 1870's.
- 11*. 422 2nd Street - McCampbell House was built about 1880.
- 12*. 413 2nd Street - Rose Carpenter House built about 1880, and later owned by George Boyd.
- 13*. 379 2nd Street - McGruder House built in 1887. Mr. McGruder was the United States Mining Inspector for hydraulic mining . It was later the home of C.F. Child.
- 14*. 360 2nd Street - Eugene Boyd House built in 1890, by M.E. Sanborn. Mr. Boyd served as Sutter County Recorder from 1931 to 1963.
- 15*. 329 2nd Street - William O'Banion House built in 1880.
16. Bogue Road - Named after nurseryman and orchardist J. Bogue. One-half mile to the west is Bogue Station on the Southern Pacific tracks along Railroad Avenue. To the east along the Feather River levee is the site of the 1955 flood levee break.

17. East of Garden Highway, north of Tudor - John A. Sutter's Hock Farm, built in 1841. The metal, rusted front of one of the buildings still stands. Toward the levee and to the south is the site of John A. Sutter's home (near the Holmes home). To the west on Messick Road, a short distance from the Hock Farm, is the site of the early Messick railroad stop.
18. Northeast corner Township and O'Banion Roads - Site of Old Bailey Home.
19. Southwest corner Garden Highway and O'Banion Road - Old C.E. Sullivan Ranch, at one time the largest single walnut grower in the world, in 1960 - 650 acres. Nuggett and Carnelo Walnuts were developed on this ranch.
20. Star Bend Road (north of Tudor) - Approximate area of the A.F. Abbott Ranch near Star Bend where the Phillips cling peach was produced and grown commercially. Developed in 1888 by nurseryman Joseph D. Phillips, the fruit, an off-shoot of the Tuscan and Orange Cling, was first propagated by J. Bogue. Near the ranch was the Abbott Station on the Southern Pacific tracks.
21. Tudor Road - Old Saunders Home, built in 1920. Located in the settlement of Tudor, another railroad station on the Southern Pacific line from the Woodland area.
22. Wilson Road - Wilson Station, site of Southern Pacific line stop, tracks and small wooden bridge remain. Two tracks are seen - one mainline track, the other a siding for handling freight, etc.
23. Kirkville Road - Chandler Station Site, Southern Pacific line stop in the early days.
24. Nicolaus - Site of Sam Brannan's "White House" to the north of the new Nicolaus Bridge, opposite the town of Nicolaus. The home was located on two square miles of land sold to him in 1849 by John Sutter. The house had eight rooms, each with fireplaces and a winding staircase in the one and one-half story structure. This house was the scene of gala parties for people from San Francisco who arrived by riverboat. This home was last owned by Charles Tweedy of Dingville, and was moved from its original site - sold again and torn down. The lumber used for the "White House" was brought around the "Horn".
25. Nicolaus - To the east of the Nicolaus Bridge is the town of Nicolaus, founded in the late 1840's. Nicolaus was one of the earliest towns in Sutter County, founded by Nicolaus Allgier. The County Seat was moved from Nicolaus in 1856 to Yuba City. The Nicolaus Ferry crossed the Feather River near Nicolaus and was started in 1843 to connect New Helvetia (now Sacramento) with Sutter's Hock Farm. The original "ferry" was rowed by Indians. Points of interest in this town include:
 - (a) Site of the Old Bell Hotel, now a two-story home is located on the site.
 - (b) Early Sutter County Courthouse, still standing, was the Frederick Vahle home in the early 1850's which served as the courthouse from 1855 to 1856. It is marked as a historical site.

(c) St. Boniface Catholic Church, built in 1919 as the Nicolaus Grammar School.

(d) Old Wagner home, built in the late 1800's.

(e) American Hotel site, near the off-ramp of old Nicolaus Bridge. Two small barns remain - one with advertising on the side. The hotel was the temporary County Courthouse in 1850 and again in 1855.

(f)* Main Street - Home of Mr. and Mrs. Frank W. McKague or converted to the first courthouse.

26. East Nicolaus - On Nicolaus Avenue, east of Nicolaus and to the south of the road is the John A. Peter house built in 1881. Note the widow's walk on top of the roof, the elaborate window cornices and roof eave woodwork. It also has an elaborately designed pumphouse in the rear of the house with various scalloped shingle sidings and window cornices.

(a)* Site of old East Nicolaus High School.

27. Rio Oso, Pleasant Grove and Bear River - The Scenic Drive continues toward Rio Oso through farm and dairy country and the Bear River Bridge at Pleasant Grove Road. Near this area is the site of the town of Oro, near Barham's Crossing just south of the Bear River. Barham was a settler who came to this area in 1849 and in 1850 built a bridge at this site. Oro existed only on paper under plans for development by State Senator Thomas Green who bought the land from John A. Sutter in 1849. His plans for Oro to become the County Seat failed on June 10, 1850 and the County Seat was moved to Auburn (then part of Sutter County), then to Vernon, and back to Nicolaus from 1852 to 1856 at which time it was moved finally to Yuba City. There was only one small tin, windowless building (shack) in this proposed town. Southeast of Barham's Crossing is the town of Pleasant Grove, an early Sutter County town with freight wagon stop and station. It had a "nickname" which has an interesting history: Due to the freight wagon trade, the town had its share of saloon brawls - a fight developed one time between two men, one gouging out the eye of the other. Thus, the name "Gouge-Eye" was given to the early town of Pleasant Grove.

28. North of Verona - The drive continues back through Nicolaus and south along the Garden Highway and Feather River toward Verona. Part of West Catlett Road is the site of Vernon on the west bank of the Feather River. The Southern Pacific Railroad once ran through this town which was the County Seat in the early 1850's.

29. Kirkville - This townsite was located on land obtained by T.D. Kirk in 1874 from Jonas Spect (the original discoverer of gold in the Yuba River). Mr. Spect obtained the land from the estate of O.S. Colegrove, an 1851 settler who named the riverside place Colegrove Point. Kirkville, never a large settlement, was a ferry crossing.

- 30*. 2 miles south of Tisdale Weir on river road named Cranmore Road - Wooley's Grave.

31. Cranmore - Continuing along the river north through farming country is the town site of Cranmore, which used to be called Poffenberger Landing. Located here is the large Les Butler home with its elaborate front entrance, built in 1888.

32. Tisdale Road - One mile south of this road is the Hunter burial site with marks for two Hunter children, the inscription reading:

Enoch Edwin - Son of S.J. and J.A. Hunter
Died 9/22/1865, age 6 years, 12 days

Jerry Lee - Son of S.J. and J.A. Hunter
Died 6/17/1867, age 1 year, 1 month

Also present in the area is a U.S. Geological Survey Benchmark, 35 feet above sea level.

33. Grimes - Continuing north past the Winship Grammar School is the site of the Grimes Ferry Crossing and the town of Grimes on the west bank of the Sacramento River.

34*. Wilbur Road, Meridian - Continuing north past the gas wells south of Meridian to the corner of Meridian and Wilbur Roads, is the "brick" house built in 1872 by Sumner Paine, a brick maker and miner who came to California from Maine in 1852. Mr. Paine also built the old Western Hotel and Methodist Church in Marysville, using similar bricks as in his house. This property was later sold to the Alameda Sugar Company of San Francisco, the arrangement promoted by the Sacramento Northern Railroad. Eventually this company became the Meridian Farm Lands Company and later changed to the Sutter Buttes Land Company. The "brick" house was originally a two-story structure with a front wood balcony supported by six wooden posts. This house had a rather elaborate wood front with a symmetrical design; a front door on each floor, balanced by two large elongated windows on each side of the doors. However, it has been remodeled considerably relative to its roofline and second story. When the Alameda Sugar Company owned the house, it was the headquarters for about 9,000 acres of surrounding land.

35. Sycamore - To the west of Kilgore Road is the site of the Sycamore Ferry crossing and the town of Sycamore.

36. (a) State Highway 20 - Site of the Old Meridian Grammar School, original structure built near here in 1875. In front of the present school building is a cement horse dismount platform with stairs and two cement hitching posts on each side.

(b) Corner of Third and Bridge - Old Sacramento Northern Railroad Station Building, made of stone and located to the west of the railroad tracks at the east approach to the old auto-railroad bridge over the Sacramento River.

(c) Meridian - Founded in 1852 by Lewis O'Neill who built a crude cabin to the south of what is now Main Street. In 1857 John F. Fouts came to Meridian and in 1860 started a ferry over the Sacramento River. In 1862 the settlement became known as Fout's Ferry. However, W.C. Smith arrived and the growing town was renamed Meridian, being barely one-fourth mile from the Meridian Line of the U.S. Survey of California, which stretches from Mt. Diablo baseline through the Sacramento Valley. In 1879 there were 120 residents of the town which was a regular stop for the stage and mail pick-up station between Marysville and Colusa which continued through the early 1900's with the addition of the Sacramento Northern Railroad line. Meridian was also the center for riverboats to load and unload cargo for the rich farming area.

37. Pass and West Butte Roads - Continue north along the River Road, turning easterly on Pass Road toward the site of the early town of West Butte, which was small but had a few stores.
38. Pass and West Butte Roads - Continue easterly to a small gray building with a bell tower which was originally the West Butte School.
39. Pass Road - To the north on the slopes of the Sutter Buttes, note the stone fences which served two purposes: (1) cleared the land of rocks for farming, and (2) in turn, utilized the rocks for fencing material.
40. Sutter Buttes, north of Pass Road - Note the unusual rock formations and strata to the north in the Buttes which now become more mountainous.
41. Sutter Buttes, north of Pass Road - To the north in a valley, is the Old Moore Getty House, built in 1871. The original homestead cabin is now the living room of the residence. The front portion was built in 1873 with brick for the fireplace hauled to the site by oxen and cart.
42. Pass Road - To the north is the house of Carl DeWitt. Part of this house is an old log cabin built in 1873, the deed of which was signed by Abraham Lincoln.
- 43*. Pass Road - Fremont Monument. General John C. Fremont is said to have camped in this area for eight days in 1846 from May 30th to June 8th, just before the Bear Flag Revolution. He called the now Sutter Buttes the "Buttes of Sacramento" and "the Three Buttes". Fremont was a pathfinder to the West and a U.S. Army Officer. The present monument was erected April 15, 1923 by the Bi-County Women's Club Federation, which is no longer in existence.
44. Pass Road - Old George E. Britton House, built in 1869-70. The stone house was made from rock which came from the Buttes. Britton settled in the area in 1853, growing 10 acres of peaches on land presently owned by Clarence DeWitt, south of Pass Road. Mr. Britton gave land for a school, church and cemetery.
45. Acacia Avenue - Turn south onto Acacia Avenue, past the Sutter High School to the town of Sutter, formerly called South Butte, Sutter City, and now Sutter, which was founded in 1871.

46. South Butte Road - West, past the marked historical site, is Stohlman Cemetery, an early Sutter County family.
- (a) Slough School - Built in 1893 and used until approximately 1960.
47. West Butte Road - Area near where William Thompson Sr. Ranch was located, on which the Thompson Seedless Grape originated.
48. West Butte Road - Fredrick Tarke House, built in 1885.
49. West Butte Road - Near the site of the first oil well in 1866. Although drillers for oil had known since 1866 of the existence of gas in the Sutter Buttes area, it was not until 1931 that incorporation of Buttes Oil Fields Company, and efforts of O.G. (Bill) Green, a pioneer in the natural gas industry, resulted in the first commercial production of fuel gas. Well Number 1 was blown on February 11, 1932 and produced 3,429,000 cubic feet of gas per day. The firm, later called Buttes Gas and Oil Company, sold gas to Pacific Gas and Electric Company. This was the beginning of present day development of fuel gas wells in Sutter County.
50. West Butte Road - Well-built and tightly designed rock fence on the west side of the road.
51. West Butte Road - Site of residence built in 1866 by Howard Brady.
52. West Butte Road - Site of small early settlement of Noyesburg; the Noyesburg Cemetery still exists.
53. West Butte Road - to the north is farm country and a hunting refuge; to the east is a sloping canyon into the Buttes, called Bragg Canyon.
54. North Butte Road - Old Pierce House, built in 1879.
55. West Butte Road - Abandoned titan missile site.
56. North Butte Road - Spillman Grave site, south of North Butte Road, well back from roadway.
57. North Butte Road - Site of the early town of Pennington, called North Butte in earlier days.
58. North Butte Road - Site of North Butte School and Lodge Historical Marker.
59. North Butte Road - Site of Peace Valley Cemetery - Historical Monument.
60. North Butte Road - Old Cornelius Williams House, built in 1890. The all brick house stands very close to North Butte Road.

61. Pennington Road - Dow Grove, site of Farm Bureau picnics in the 1920's.
62. East Butte Road - Site of Camp Bethel, built in 1862 on property of Gilbert N. Smith, ranch near Sand Creek, east of the Buttes. Although East Butte was never a town, this location near the Sutter Buttes was early settled by ranchers. In 1862 the Reverend Mr. George Baker raised subscriptions and built a house or board pavilion in the wooded grove at East Butte. This building was about 100 feet square and provided with seats. The annual Methodist Camp Meeting was held there with services conducted in this building. In the winter of 1873, the old Bethel was ruined by snow and a new one was erected. "Camp Bethel" was established originally for the Feather River Methodist Circuit (Sutter, Yuba, Butte and Yolo Counties).
63. East Butte Road - Albert N. Smith House, built in 1888. Previous owners of the two-story wooden house on the west side of the road north of Sanders Road, were also the Burns and Langs.
64. East Butte Road - E.J. Howard House, started in 1862 with the balance of the house added between 1862-70. The floor of the house was brought from Yuba City and was part of a hotel. A private road goes back to the house which is west of the Sanders and East Butte Roads intersection, well off the road.
65. East Butte Road - Old Union District Grammar School site, also used as a Sunday School, was started in 1868 and continued in use until 1917.
- 66*. (a) Butte House Road - site of the "Old Butte House" which was a stage stop. Still present is the watering trough, erected between 1910-1914 by the road districts; to defray the cost, ads were put in the newspaper. On the sides of the trough, names of various local business establishments were engraved in the cement which helped to defray the cost of the trough. Water was siphoned up from a well below the trough by a hand pump. This is the only trough of its kind in the area.
- (b) 2234 California Street, Sutter - Old Felts Building, built of brick in 1890 of thick walls, was an old store and early post office.
- (c) Corner of California and Nelson Streets, Sutter - Native Daughters of the Golden West Hall, Local 226, built in 1888 was originally designed for but never used as a bank.
67. Butte House Road - Sutter Cemetery, where once a small grammar school was located in the center of the cemetery. Whenever a funeral was held, school was dismissed for the day.
68. Acacia Avenue, Sutter - Old Sacramento Northern Railway Depot; the track seen here connected Yuba City, Colusa and Live Oak. Between Yuba City and Meridian were several "whistle stops", including (from east to west) Harter, Almendra, Humphrey, Noyes, Summy, Stohlmán, Tarke, Lira, Hageman and Farmlán Stations.

69. Humphrey Road - Site of early Humphrey Station Stop.
70. Clark Road - Set well back from the road with a private driveway on the south side of Clark Road is an old house somewhat of the "Southern Style" with the driveway covered by large walnut trees. A rather large, square structure with symmetry and balance, noted by the large elongated front door with equal windows on either side. A very unique feature is the elaborate wrought iron widow's walk fence (usually wooden) with wooden roof eave braces and craftsmanship.
71. Clark Road - Site of Stafford Station, Sacramento Northern Railway formerly extending to Chico through Durham. Small stations once existed along these tracks.
72. Pennington Road - One of the first houses in Live Oak. Built for Louis Schnepel in 1883. In January 1924, it was moved to its present location, 2447 Pennington Road, from the site on Broadway where the Odd Fellows Hall was built in Live Oak.
73. Larkin Road - One of the first homes in Live Oak. This old residence was moved a short distance from its original site due to the construction of Highway 99, to its present location on Larkin.
74. Live Oak Highway, between Eager and Pease Roads - Sutter's Hock Farm Historical Monument, first white settlement in Sutter County established in 1841. Farm partially destroyed by debris from mining flood water.
75. Live Oak Highway - Site of Berg Station, Southern Pacific Railroad.
76. Live Oak Highway - Site of the old Berg Ranch of 2,000 acres. Berg Brothers were Herman and Frederick.

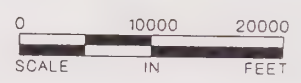
NOTE: Many railroad stations are mentioned on the tour. In Sutter County the main large stations had an agent with facilities for handling freight and were located at Meridian, Sutter, Live Oak and Yuba City. All of these stations are still in existence but some not in use. The other stations mentioned, such as Humphrey and Chandler, were small with only a roof, no agent, and were mainly "whistle stops" for passengers. Some of the small stations had a siding track for freight cars to be loaded with freight and farm produce. The Sacramento Northern Railroad was originally called the Northern Electric, with three-rail tracks from Yuba City to Colusa and from Yuba City to Chico. The two outside rails were for the train wheels, the middle, a "hot rail" for electricity. The Sacramento Northern Railway never had steam engines, only electric, which were converted to diesel in the early 1940's.

77. Harter Road - Harter House built in 1872. Harter cannery was an important early drying and canning facility.
78. 2078 Colusa Highway - Jake Onstott House built in 1887 by the pioneer grain rancher.

SUTTER COUNTY

HISTORIC SITES and POINTS OF HISTORICAL INTEREST

SEE DETAIL BELOW FOR LOCATIONS IN YUBA CITY



prepared by the
SUTTER COUNTY COMMUNITY SERVICES DEPARTMENT

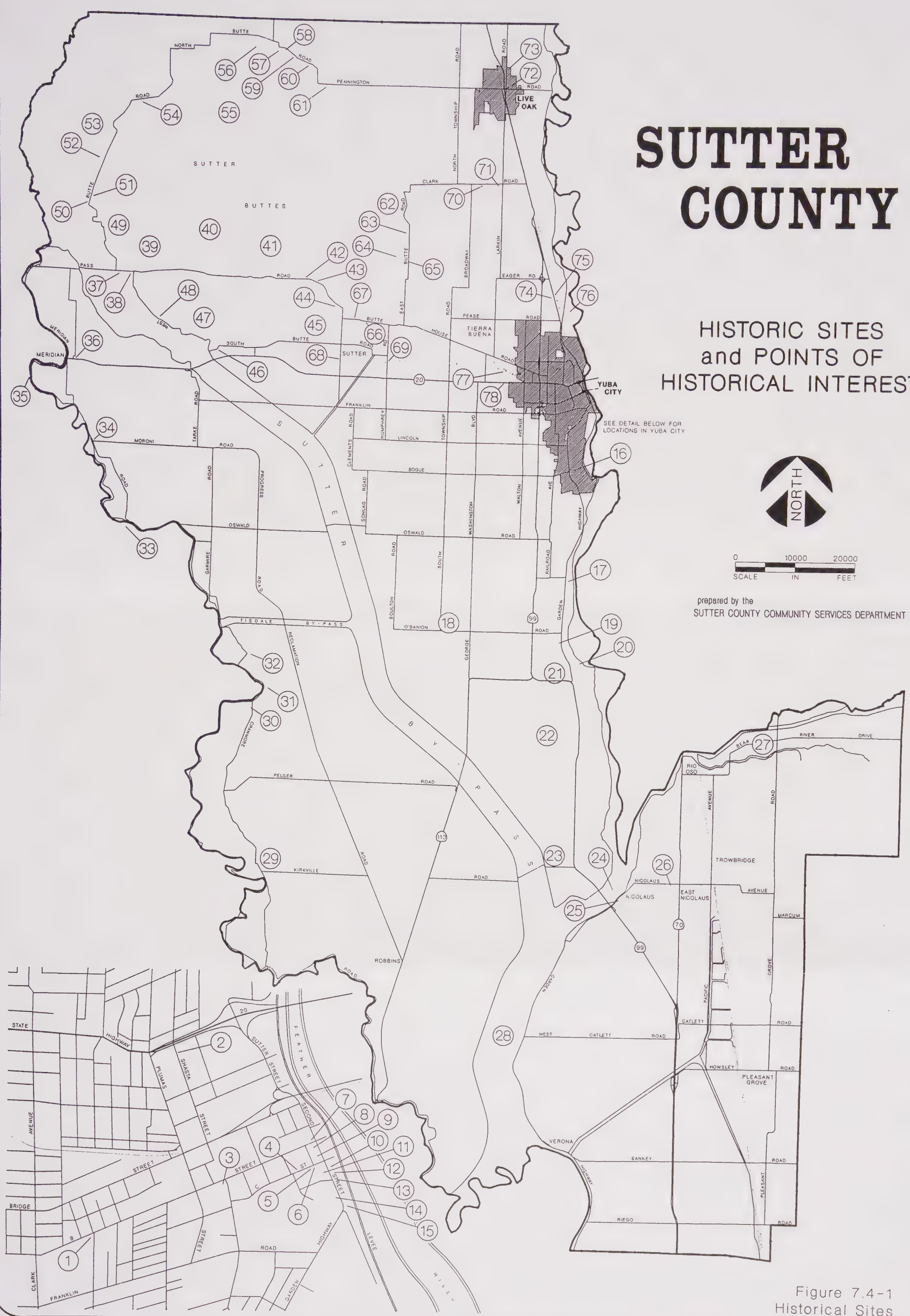


Figure 7.4-1
Historical Sites

7.5 RECREATION PLANNING STANDARDS

The Yuba City Parks and Recreation Department has adopted its own park standards in its recent master planning effort. Yuba City's definitions and associated standards are included in the City's 1985 Park and Recreation Element of the General Plan. These standards include a ratio of 10 acres per 1,000 persons for overall park development. This ratio is then broken down into fractional components for: neighborhood, community and regional facilities.

The City of Live Oak has no formal written guidelines or standards. However, the draft 1993 General Plan proposes a ratio of 10 acres per 1,000 persons as a standard for establishing new parks.

Sutter County has incorporated a standard of 10 acres per 1,000 persons in its current General Plan. The urban area population is changing rapidly and planning goals must be responsive to future demands while maintaining this standard.

7.6 STATE AND FEDERAL PARK CAMPGROUNDS, RESERVES

STATE RECREATION RESOURCES

Existing recreational facilities are provided and administered by the State of California Department of Fish and Game encompassing several thousand acres, much of which may be utilized as hunting areas. Table 7.6-1 lists Sutter County's state reserves and state recreation areas and their general locations.

FEDERAL RECREATION RESOURCES

No forest or range lands administered by the U.S. Forest Service are located within Sutter County.

TABLE 7.6-1

STATE OF CALIFORNIA RECREATIONAL RESOURCES

1. **Butte Slough Wildlife Area** (178 acres) - south of Pass Road, west of West Butte Road
 2. **Feather River Wildlife Area** (2,265 acres):
 - Abbott Lake Management Unit** (438 acres) - east of Garden Highway at the end (and north) of Star Bend Road
 - Lake of the Woods Management Unit** (662 acres) - accessible by boat only from the Star Bend Fishing Access and Boat Ramp on Feather River Boulevard (in Yuba County)
 - Nelson Slough Management Unit** (751 acres) - east and west of Highway 99 on Sacramento Avenue, north of Nicolaus and the Feather River
 - O'Connor Lakes Management Unit** (364 acres) - east of Garden Highway at the end (and south) of Star Bend Road
 - Star Bend Management Unit** (50 acres) - east of Garden Highway, at the end of and south of Star Bend Road
 3. **Gray Lodge Wildlife Area** (8,400 acres) - accessible from Gridley Road (in Butte County)
 4. **Sutter By-Pass Wildlife Area** (3,766 acres) - ribbons of land areas running the length of the By-Pass from Highway 20 to Nelson Slough
-

7.7 RECREATION CORRIDORS, TRAILS AND SPECIAL AREAS

Several transportation corridors in the County provide access to recreational opportunities described previously. State Highway 99 runs the length of the County and provides access to valley and riparian environments and recreation areas. Highway 99 parallels the Feather River from the Butte County line to the point where the highway crosses the river northwest of Nicolaus. State Route 20 is an important transportation corridor extending the full width of the County from Meridian to Yuba City and into the Sierra Foothills in Yuba County. Highway 20 provides access through the Sutter Buttes via Acacia Avenue and Pass Road.

7.8 PRIVATE RECREATION FACILITIES

There are a number of private recreational lands and facilities in the County which provide leisure activities, both for public and private use. Generally, golf, tennis and other sports clubs, baseball and softball, and swimming are the more popular recreational activities.

Recreation facilities in the Yuba City area tend to provide active-type opportunities. These include bowling alleys, public and private golf courses, a driving range, miniature golf, diving instruction, swimming pools, health spas, tennis and racquetball courts, hunting and fishing preserves, pistol and rifle ranges, museum, playgrounds, and parks.

Private recreational facilities in the rest of the County are limited and tend to provide more leisure oriented, passive opportunities and focus on the environs.

HOTELS, MOTELS, RESORTS, AND BED-AND-BREAKFASTS

Overnight visitor accommodations in Sutter County, excluding camping, are found primarily in the Yuba City area with scattered accommodations elsewhere in the County. The Yuba City Area has an estimated 8 hotel/motels and two bed-and-breakfasts. The Live Oak area has an estimated 1 hotel/motel.

PRIVATE CAMPGROUNDS

Private developed opportunities for both tent and recreational vehicle camping are lacking in Sutter County. Lake Minden south of East Nicolaus and the Verona Marina are the only facilities which provide this type of opportunity.

No private tent camping exists and private recreational vehicle campgrounds are in very limited supply. Lake Minden located on Marcum Road at Powerline Road has 263 spaces and the Verona Marina has 44 spaces. Several mobile home parks in Sutter County have space available for overnight RV campers.

COMMUNITY EVENTS

Several community events play a large role in the social life of Sutter County residents. A variety of clubs organize a number of events staged throughout the year. Most of the larger crowd events are held at the Yuba Sutter Fairgrounds which can accommodate both indoor and outdoor activities.

SCENIC HIGHWAY CORRIDORS

Sutter County has no officially designated state scenic highways, as are identified in the "Master Plan of State Highways Eligible for Official State Designation by the California Department of Transportation".

There are a number of visually and aesthetically scenic roadways throughout the County. These consist of such roadways as those around and through the Sutter Buttes and those along the Sacramento and Feather Rivers.

7.9 FINDINGS

- In-migration of new residents and historical growth patterns impact the supply and demand for recreation areas.
- The County has an unmet demand for organized trails systems (foot, bike, equestrian).
- Mechanisms to provide, operate and maintain recreational facilities are needed in the County.
- Recreational facilities and their use, and the use of non-developed open space or recreational lands may present conflicts with existing or proposed land uses.
- Insufficient resources, both financial and human, presently exist for recreation planning and ongoing maintenance in Sutter County.

7.10 PERSONS CONSULTED

Adams, Lori, Clerk. City of Live Oak

Breisacher, Marci. California Office of Historic Preservation

Duncan, Laura. Yuba City Redevelopment Agency

Elder J., Sandra. California Office of Historic Preservation

Gillmore, Barbara. Yuba City Parks and Recreation Department

King, Richard. Planning Consultant to the City of Live Oak

McVey, Dan. Sutter County Community Services Department

Moore, Dean. Yuba City Parks and Recreation Department

Rivas, Pierre. El Dorado County Community Development Department

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CHAPTER 8

CULTURAL RESOURCES

8.1 INTRODUCTION

This chapter discusses the cultural resources within Sutter County.

The physical character of Sutter County has evolved to what we see today through a variety of cultural changes and historic events that are both interesting and enlightening. These events have either been preserved in archaeological sites, lost through natural or human destruction, or chronicled and recorded in a variety of historic resources. Such resources not only deserve recognition and preservation but prominence in the community.

The California Archaeological Inventory Information Center indicates a total of forty-one formal archaeological reconnaissances have been conducted within the County covering barely 10,000 of the County's 388,000 acres. Seventy-eight archaeological sites were recorded as a result of these surveys. This information demonstrates that many unknown archaeological sites may be located throughout the County.

Sutter County adopted a Home Rule Resolution on March 7, 1995. This resolution reiterated the obligation federal and state agencies have to obtain input from the County with regard to actions that conflict with Sutter County's land use plan, policies and controls. The National Environmental Policy Act (NEPA) requires the federal government to consider impacts on the local culture, heritage and economics. Should inconsistencies occur, the Environmental Impact Statement should describe the extent to which the federal agency would reconcile its proposed action with the local plan or law.

The Sutter County General Plan sets forth to balance economic growth with the protection of agriculture, the environment and the custom and cultural qualities that make Sutter County unique. It also reflects the aspirations and values of Sutter County residents regarding the character of the County. The Cultural Resources Chapter, along with the Land Use and Economic Chapters in the Background Report, provide the foundation for the Home Rule Resolution and the basis for goals and policies to maintain Sutter County's unique environment.

8.2 PRE-EUROPEAN SETTLEMENT ERA

Evidence indicates that the region had been occupied by Native Americans for thousands of years. The tribes included the Patwin, Wintun and Maidu. The Maidu, which simply means "the people", lived in the Sacramento Valley and surrounding foothills. The southernmost Maidu were the Nisenan. Nisenan lands were comprised of the drainages of the Yuba, Bear and American Rivers and the lower drainages of the Feather River. Maidu society was organized into tribelets. A tribelet was a conglomeration of villages numbering two to twenty or more. Some villages had populations of

1,000 or more, others were made up of only one or two families. The Nisenan were hunters and gatherers with the valley and foothills providing enough food and shelter to meet their needs. Their diet consisted of acorns as a staple with a tremendous variety of roots, nuts, bulbs, seeds, greens and berries. Meat was obtained from antelope, deer, elk, small game, fish and birds. The tremendous natural productivity of the area was able to support a relatively large population of subsistence inhabitants.

Sutter County has a very significant cultural feature that is just as significant a geologic feature. The Sutter Buttes rise to over 2,100 feet above sea level and provide the only geographic relief in the otherwise level Sacramento Valley. This small mountain range is considered by the Maidu as the spiritual center from which life originated. It is also believed that the spirit travels there on its journey to the afterlife. There are many colorful Native American legends regarding the origin of the Buttes. Records indicate only limited archaeological surveys have been conducted within the Buttes, which occupy approximately 40,000 acres.

The first European to see the Sutter Buttes was Gabriel Moraga, a Spaniard trying to locate mission sites in 1808. Another Spaniard, Luis Arguello, led an expedition in 1817 to explore Northern California by water. He called the Buttes "Los Picachos" or "the peaks". He also named the Feather River "El Rio de las Plumas", because he saw many feathers of wild fowl floating on the water. In 1828, the renowned mountain man Jedediah Smith trapped in the vicinity of the Buttes. It was in 1833 a brigade of French fur trappers from the Hudson Bay Company first referred to these mountains as the "buttes". This contingent is believed responsible for the introduction of the small pox virus to the Native American population. This devastating illness is attributed with killing up to 75% of the Maidu and resulting in the abandonment of many villages in a single year.

An interesting insight into some of the historical characters of the time can be found in the story of Indian Peter, a Sioux Indian who came to California with the Jedediah Smith party in 1828. Indian Peter once told of two great battles with the Indians. The trappers were defeated in the first battle and the Indians were badly whipped in the second. Peter mentioned that minor skirmishes with the Indians took place most of the time. When the trappers returned, Peter remained in the area because the hunting was better than at any place he had been before. Peter later married a French woman and had three daughters, all being great hunters, especially the eldest who used to go out hunting with her father. She commonly rode upon a stallion when she hunted elk and deer. Peter's daughter even saved his life from the paws of an angry grizzly bear when they were smoking the bear out of a cave:

The fellow came out sooner than expected, was about to leap from a rock upon Peter when a well directed shot from the girl's rifle killed him. Later on Peter went to the Sutter Buttes to shoot antelope, when he was badly attacked by a female grizzly bear, deprived of her cubs a few days before. She knocked his gun from his hand and seized his head in her paws. While in this position, Peter drew his knife and succeeded, after many cuts, in killing her. His head was terribly mangled and the wound would never completely heal. He wore a cloth about his head and died a few years later from the effects of his wound, and whiskey.

EUROPEAN SETTLEMENT ERA

Sutter County derives its name from one of its first settlers, John Augustus Sutter. In 1841, after settling at Sutter's Fort, he established Hock Farm, believed to be a corruption of the German word "hoch" or "upper", on the site of a Nisenan village originally located there on the west bank of the Feather River about eight miles south of Yuba City. In establishing the Hock Farm he created the first important agricultural project in this part of the state. Sutter planted grapes, pomegranates, fig trees and the first peach orchard on his land at Hock Farm, as well as using it as a stock ranch.

With the 1848 discovery of gold at Sutter's sawmill in Coloma on the south fork of the American River and the rapid spread of mining to all foothill areas, the culture and life style of the Nisenan were severely disturbed. Widespread disruption of the people and destruction of their villages and other sites occurred with the resulting influx of miners and mining activities. At the same time, farming was begun in the Valley, impacting native culture in the lowlands.

Sutter County itself experienced little mining, but was attractive for its agricultural potential and was primarily settled by former miners who became interested in agriculture after 1860. Early activities included the cutting of wild hay, herding of stock and the harvesting of lumber along the rivers. (It has been reported that when the early settlers arrived a belt of woodland extended along all the major rivers from one-quarter to two miles in width, consisting of oaks, sycamores, cottonwoods, and willows. This growth was soon cleared to provide lumber fuel for steamboats, as well as for building supplies, and also to clear land for farming.)

During the gold rush, as hundreds of thousands of new immigrants flooded into California, hostilities between whites and Indians rapidly accelerated. White miners, ranchers and farmers came to see the Indians as threats to their prosperity and security, an obstacle blocking progress. Many of the immigrants believed that Indians were primitive and therefore that they were all the more repulsive and expendable. There is a traceable evolution of attitudes based on the changing needs of the whites. Needing to discredit Hispanic claims to California, American observers saw the Indians as victims; needing to acquire a cheap labor force, they viewed the Indians as a useful class; needing to gain unimpeded access to the resources of the Golden State, they regarded the Indians as obstacles to be eliminated. These attitudes also tolerated the 1850 California legislative act authorizing the indenture of Indians, a thinly disguised substitute for slavery, or the common practice of kidnaping Indian children and women, and openly selling them as servants. The unfortunate events that followed included the massacre of many remaining villages, and in 1863 some 461 Indians, mostly Maidu, were force-marched 125 miles to the Round Valley Reservation during which many were killed or died with only 277 completing the journey, most in poor health.

During the 1870's and 1880's, valuable farmland in Sutter County was lost to the silting up of the rivers caused by hydraulic gold mining in the Sierras. Local farmers formed the Anti-Debris Association, and in 1884, they won a landmark suit halting the practice of hydraulic mining. Once land was cleared, river bottom land claimed and hydraulic mining stopped, agriculture developed rapidly. Several famous agricultural varieties were developed in Sutter County, including Proper Wheat in 1868, which opened up the wheat exporting market in Sutter County; the Thompson Seedless Grape in the 1870's, which led to a thriving raisin industry; and the Phillips Cling Peach in the 1880's, which paved the way for a surge in the canning industry, with three local canneries established.

Several organizations, important to the prosperity of Sutter County, were created as a result of agriculture. The Farmers' Cooperative Union of Sutter County grew out of the farmers concerns about speculators who worked together to keep the prices paid to farmers low, regardless of the market. These speculators also worked in concert to drive up the price of transportation of agricultural products. The Farmers' Cooperative Union, begun by S.E. Wilson, B.F. Walton, George Ohleyer, A.L. Chandler, Francis Hamlin, George Brittan and Henry Elmer, enabled the farmers to join together and act to improve prices paid to farmers. Other organizations include: the Farmers' Union Bank, the financial branch of the Farmers' Cooperative Union; Producers' Bank of Yuba City; the Nicolaus Farmers' Grain Warehouse; the California Fruit Cannery Association, now known as the Californian Packing Corporation.

Agriculture and the promise of a stable and prosperous future brought many different kinds of people to Sutter County. One such people were the East Indian Sikhs of the Punjab province of India. Beginning around 1910, East Indians moved to the Central Valley of California. Originally brought to the Sutter County area as workers on roadbeds for the electric railroads, the East Indians turned their attention to orchard and farm work.

Many people had an impact on the way in which Sutter County has developed. They include: B.F. Walton, largely responsible for the development of the peach canning industry in the County; J.T. Bogue, the first nurseryman to propagate the Phillips cling peach commercially; E.T. Thornbrough, of Meridian who first brought prune trees to the area; George Ohleyer, founder and editor of the Sutter County Farmer newspaper and one time supervisor; Allen Noyes, who acquired land on the west side of the Buttes, creating the village of Noyesburg and deeding, upon his death, land to the school and cemetery districts; Frederick Peter Tarke and Frederick Hoke, who as young men were drawn to the gold fields but soon decided that they might better make their living in a ranching and agricultural partnership that encompassed several thousand acres of land on the southwest side of the Buttes; Harry Stabler, one of the first County Agricultural Commissioners; William Thompson, a Sutter resident and propagator of the seedless grape; and John Paxton Onstott, responsible for establishing the raisin industry in the United States.

Sutter County was one of the 27 original counties of California, set up by the first Legislature on February 18, 1850. The original county seat was located in Oro, but as there was no suitable building, it was moved to Nicolaus. In 1851 the Seat was moved to Auburn, but when Placer County was formed later that year the town of Vernon (now called Verona) was selected. As Vernon's growth declined, the Seat moved back and forth between Nicolaus and Yuba City, where it was permanently located in 1856.

Yuba City was named after and founded upon the site of a Nisenan village in 1849 by Sam Brannan, Pierson Reading and Henry Cheever. A year later Yuba City was nearly abandoned as neighboring Marysville on the east side of the Feather River grew rapidly, becoming a major supply point for the gold mines in the Sierras. As the Gold Rush continued and many miners became less enchanted with the gold fields, many of them began moving into Sutter County to develop the rich agricultural land, and Yuba City flourished again to eventually become the larger city. In 1908 Yuba City became incorporated.

Live Oak evolved as a commercial center to serve the agricultural population where alfalfa, dairying, fruit and nuts were quite prominent. Live Oak became an incorporated community in 1947, the second and last incorporated community in Sutter County to date.

The town of Sutter traces its origins to 1849 when Edward Thurman and a partner built a cabin at the east end of the Sutter Buttes. Four years later G.E. Brittan purchased the Thurman land and built a two-story home out of the Butte rock. As the agricultural industry developed and thrived, the community continued to grow. In 1887, real estate speculator and developer P.D. Gardemeyer arrived on the scene with a grand view of the future of "Sutter City". Plans were laid out for a large and modern city but unlawful land deals caused Gardemeyer to quietly and quickly leave town. Shortly thereafter Sutter dropped the "City" from its name.

There are two Registered Historical Landmarks located within Sutter County. No. 346 is the site of John Sutter's Hock Farm, the first non-Indian settlement in Sutter County. No. 929 is the site where William Thompson settled and propagated what has come to be known as the Thompson Seedless Grape. There are also twenty-one (21) Points of Historical Interest in Sutter County as identified by the California Department of Parks and Recreation Office of Historic Preservation. Additional discussion of points of historic interest and California Historical Landmarks can be found in the Recreation Chapter.

Sutter County has continued to rely on its agricultural resources as the primary economic base. The cropping patterns have evolved into two predictable types. Those areas nearer the rivers with the coarser soils are extremely well suited to orchard crops while the lowlands farther from the rivers with the clayey soils are well suited to the production of rice. A variety of truck crops and grains are also grown in various locations. Grazing is the predominant agricultural use in the Buttes with scattered grain and orchard farming.

8.3 FINDINGS

- A limited portion of the County has been surveyed for prehistoric, historic, cultural or archeological resources.
- There is a record of early explorers witnessing a large population of Native Americans within the Sacramento and San Joaquin Valleys.
- Agricultural uses and urban development may have already compromised a significant number of prehistoric sites.
- The Sutter Buttes have served as a point of cultural and historic significance in Sutter County.
- Agriculture continues to be the predominant land use as well as economic and cultural base for Sutter County.

- The County's customs, culture and economic base are reflected throughout the Land Use, Economic and Cultural Resources Chapters of the Background Report.
- Sutter County has two registered California Historical Landmarks, twenty-one Points of Historic Interest and a number of other sites considered to have local or county-wide historic and cultural significance.

8.4 PERSONS CONSULTED

Dreyer, William, Assistant Coordinator. California Archaeological Inventory Information Center, Department of Anthropology, California State University Chico

Heinrich, Ira, Director. Middle Mountain Foundation, Sutter, California

Lowe, Jacqueline, Director. Community of Sutter County Memorial Museum

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CHAPTER 9

NATURAL RESOURCES

9.1 INTRODUCTION

This chapter presents background information on Sutter County's natural resources, including agricultural, mineral, water, biological and air quality resources. The primary resource related industries within the County are in agricultural production and processing and natural gas production. Other resource extraction activities within Sutter County include several surface mines located around the Sutter Buttes and occasionally at other locations in the rural area. Other resource issues relating to surface and groundwater, vegetation and wildlife, and air pollution and quality are addressed in this chapter.

9.2 AGRICULTURAL RESOURCES

Overview

Sutter County is an agricultural county. The 1992 Census of Agriculture classifies 81.9 percent of the County's acreage as being in farms. This is the third highest percentage of land area of all counties in the State, behind only San Joaquin County at 98.4 and Merced County at 93.5 percent. Table 9.2-1, from the 1992 Census of Agriculture, summarizes agricultural land use in Sutter County.

TABLE 9.2-1

SUTTER COUNTY FARMLANDS

Land in County	388,358 Acres	Wheat for Grain	25,746 Acres
Land in Farms	318,158 Acres	Barley for Grain	622 Acres
Total Cropland	270,897 Acres	Rice	76,130 Acres
Harvested Cropland	232,014 Acres	Hay	9,627 Acres
Irrigated Land	200,646 Acres	Vegetables	22,829 Acres
Woodland	15,856 Acres	Orchards	57,479 Acres

Source: United States Census of Agriculture, 1992

The County's valley floor location between two major rivers has created over geological time a broad area of deep, rich agricultural soils with abundant surface and subsurface water. Together with an inland climate that provides for a long growing season, these factors have lead to a productive agricultural environment. Table 9.2-2 lists the total gross value of the County's agricultural commodity production from 1945 to 1992 as compiled by the Sutter County Agricultural Commissioner.

As can be seen from Table 9.2-2, the value of agricultural commodities produced in the County varies greatly from year to year. The reason for this price variation has to do with the fluxation of farm commodity prices, both nationally and internationally. Production value hit a high in 1981 at \$316,465,000 while 1988 showed a "bottoming-out" of agricultural gross value during the 1980's. The first five years of the 1990's show continual upward movement in gross value and values are expected to continue upward, in part, due to potential overseas rice sales in Japan and Korea.

Agricultural activities within the County can generally be placed into one of two classes, either intensive agriculture, which includes field crops, seed crops, vegetable crops, fruit and nut crops, nursery stock, and apiary products (bee keeping), or extensive agriculture, which involves animal husbandry forms of agriculture. Table 9.2-3 summarizes the value of agricultural production by production groups from 1991 to 1994.

TABLE 9.2-2
GROSS VALUE OF AGRICULTURAL PRODUCTION

YEAR	VALUE	YEAR	VALUE
1945	\$33,381,000	1970	\$77,238,000
1946	\$41,347,000	1971	\$82,209,000
1947	\$41,291,000	1972	\$95,118,000
1948	\$39,684,000	1973	\$159,204,000
1949	\$36,731,000	1974	\$179,719,000
1950	\$41,930,000	1975	\$187,517,000
1951	\$52,003,000	1976	\$178,554,000
1952	\$49,494,000	1977	\$200,787,000
1953	\$44,815,000	1978	\$220,502,000
1954	\$38,783,000	1979	\$258,666,900
1955	\$43,224,000	1980	\$299,014,700
1956	\$49,381,000	1981	\$316,465,900
1957	\$41,313,000	1982	\$247,784,100
1958	\$38,786,000	1983	\$205,335,300
1959	\$50,707,000	1984	\$262,285,500
1960	\$50,536,000	1985	\$255,449,600
1961	\$55,585,000	1986	\$229,364,800
1962	\$57,322,000	1987	\$216,183,600
1963	\$55,155,000	1988	\$201,345,800
1964	\$66,740,000	1989	\$243,940,200
1965	\$64,564,000	1990	\$217,400,000
1966	\$71,627,000	1991	\$268,941,900
1967	\$69,313,000	1992	\$285,622,700
1968	\$80,275,000	1993	\$292,108,300
1969	\$74,006,000	1994	\$343,203,000

Source: Sutter County Crop Report, 1994

TABLE 9.2-3

**SUMMARY OF AGRICULTURAL
PRODUCTION FARM VALUE**

	1991	1992	1993	1994
Fruit and Nut Crops	\$113,030,600	\$115,187,800	\$119,990,900	\$127,468,300
Field Crops	\$78,606,100	\$94,164,000	\$101,450,200	\$136,287,100
Seed Crops	\$5,920,500	\$9,468,800	\$8,673,700	\$8,377,700
Vegetable Crops	\$49,890,700	\$45,942,400	\$39,563,000	\$50,438,300
Nursery Crops	\$4,634,400	\$6,150,600	\$8,888,400	\$9,116,400
Apiary Products	\$1,624,000	\$725,500	\$701,400	\$530,800
Livestock and Poultry	\$14,224,800	\$13,731,100	\$12,647,400	\$10,789,100
Livestock and Poultry Products	\$1,010,700	\$252,500	\$193,300	\$195,300
Total	\$268,941,800	\$285,622,700	\$292,108,300	\$343,203,000

Source: Sutter County Crop Reports, 1992 and 1994.

Table 9.2-4 lists the ten leading crops by value from 1991 to 1994.

TABLE 9.2-4

LEADING CROPS BY VALUE

1991		1992	
RICE, all **	\$54,266,300	RICE, all**	\$68,046,100
PRUNES, Dried	\$49,134,500	PRUNES, Dried	\$44,364,700
TOMATOES, all**	\$37,100,100	PEACHES, all	\$34,965,400
PEACHES, all	\$32,619,300	TOMATOES, all**	\$30,694,900
WALNUTS, all	\$22,756,100	WALNUTS, all	\$22,336,100
CATTLE & CALVES	\$10,866,400	MELONS, all**	\$15,350,400
MELONS, all**	\$10,050,100	CATTLE & CALVES	\$11,174,500
BEANS, dry, all**	\$7,609,000	NURSERY PRODUCTS, all	\$6,026,000
NURSERY PRODUCTS, all	\$4,634,400	WHEAT, GRAIN, all**	\$5,995,800
WHEAT, GRAIN, all**	\$4,469,800	BEANS, dry, all**	\$5,309,800

TABLE 9.2-4 CON'T.

1993		1994	
RICE, all **	\$71,751,500	RICE, all**	\$103,435,500
PRUNES, Dried	\$29,210,600	PRUNES, Dried	\$58,224,200
TOMATOES, all**	\$27,306,900	PEACHES, all	\$29,857,100
PEACHES, all	\$31,928,900	TOMATOES, all**	\$36,138,900
WALNUTS, all	\$40,821,300	WALNUTS, all	\$25,628,800
CATTLE & CALVES	\$10,373,400	MELONS, all**	\$13,581,200
MELONS, all**	\$10,660,200	CATTLE & CALVES	\$8,650,900
BEANS, dry, all**	\$8,665,000	NURSERY PRODUCTS, all	\$9,116,400
NURSERY PRODUCTS, all	\$8,888,400	BEANS, dry, all**	\$7,513,400
ALMONDS, all	\$8,148,000	ALFALFA HAY, all	\$6,978,200

* Acreage from Cling Peach Advisory Board

** Include Seed - Rice does not include Wild Rice

Source: Sutter County Crop Reports, 1992 and 1994

Soil Quality and Evaluation System

The soils of Sutter County vary in productivity. This variation is based upon different qualities of the soils found in the County. In 1986, the U.S. Soils Conservation Service (SCS) published the "Soil Survey of Sutter County, California". That survey classified each of the soil groups in Sutter County based upon the SCS Land Capability Classification System. The SCS system, which is based on effective soil depth, texture, water retention characteristics, slope, erosion potential, drainage and alkalinity-salinity factors as they relate to climate and precipitation, is the most universally recognized agricultural soil classification system. As shown in Table 9.2-5, soils are divided into eight classes indicated by Roman numerals based on these characteristics. Soils in Classes I through IV are considered suitable for cultivation, while soils in Classes V through VIII are generally unsuited for agriculture, although these soils may be used for range, watershed, wildlife and other non-intensive agricultural uses. Class I and II soils are considered "prime" agricultural land, Class III soils are considered "good", and Class IV soils are considered "fairly good" for agricultural use.

TABLE 9.2-5

**SOIL CONSERVATION SERVICE
LAND CAPABILITY CLASSIFICATION**

CLASS	LIMITATIONS
I	Soils have few limitations that restrict their use.
II	Soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices.
III	Soils have severe limitations that reduce the choice of plants or that require special conservation practices, or both.
IV	Soils have severe limitations that reduce the choice of plants or that require very careful management, or both.
V	Soils are not likely to erode but have other limitations, impractical to remove that limit their use.
VI	Soils have severe limitations that make them generally unsuitable for cultivation.
VII	Soils have very severe limitations that make them unsuitable for cultivation.
VIII	Soils and miscellaneous areas have limitations that nearly preclude their use for commercial crop production.

TABLE 9.2-6

**SUTTER COUNTY AREA CLASSIFICATION
BY SCS LAND CAPABILITY CLASSIFICATION**

SOIL CLASS	ACRES
I	70,445
II	114,333
III	91,220
IV	73,850
V	0
VI	30,445
VII	2,055
VIII	1,670
Water Area	4,340
Total	388,358

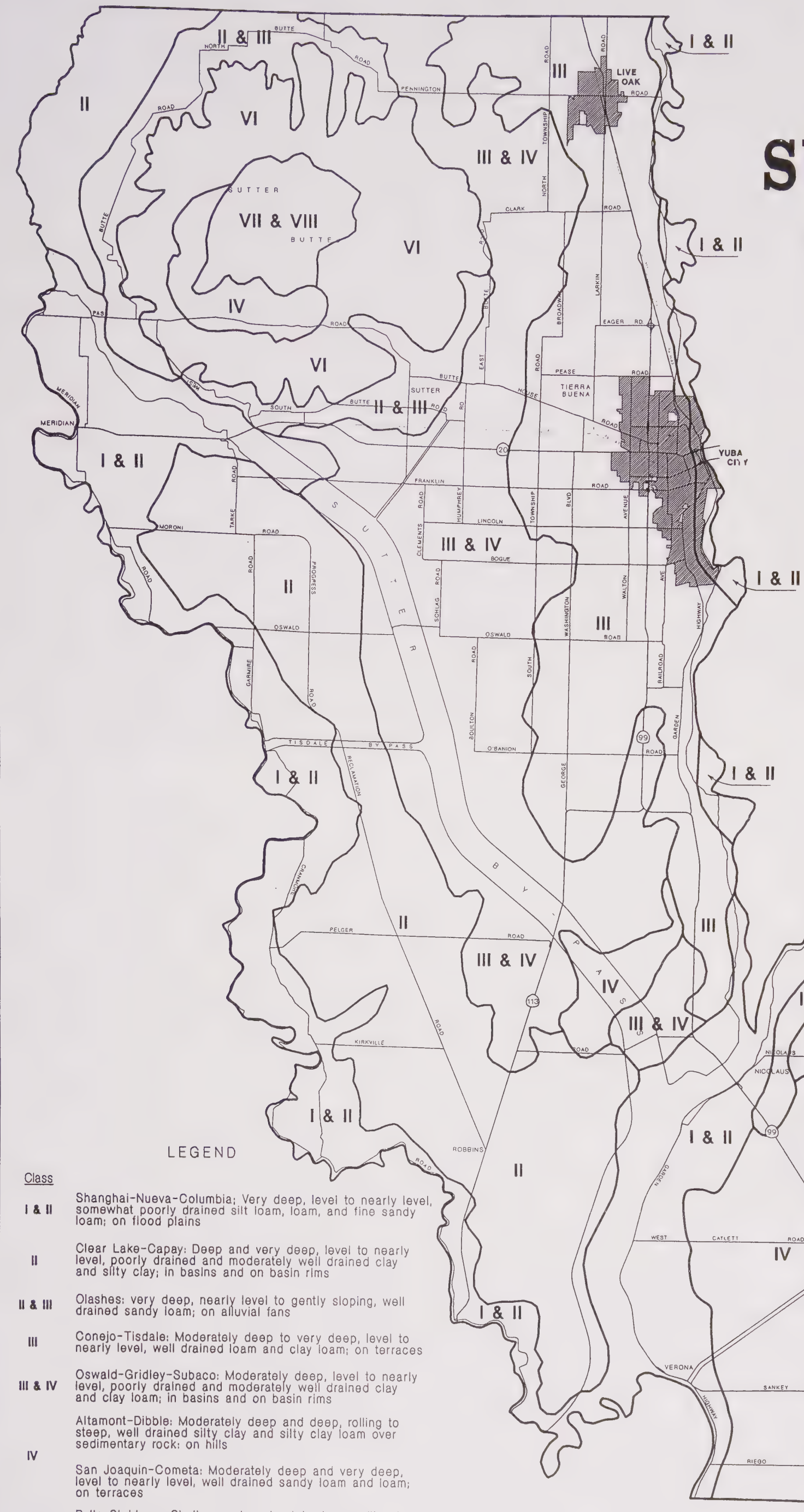
SUTTER COUNTY

SOIL CLASSIFICATIONS



0 10000 20000
SCALE IN FEET

prepared by the
SUTTER COUNTY COMMUNITY SERVICES DEPARTMENT



LEGEND	
Class	
I & II	Shanghai-Nueva-Columbia: Very deep, level to nearly level, somewhat poorly drained silt loam, loam, and fine sandy loam; on flood plains
II	Clear Lake-Capay: Deep and very deep, level to nearly level, poorly drained and moderately well drained clay and silty clay; in basins and on basin rims
II & III	Olahe: very deep, nearly level to gently sloping, well drained sandy loam; on alluvial fans
III	Conejo-Tisdale: Moderately deep to very deep, level to nearly level, well drained loam and clay loam; on terraces
III & IV	Oswald-Gridley-Subaco: Moderately deep, level to nearly level, poorly drained and moderately well drained clay and clay loam; in basins and on basin rims
IV	Altamont-Dibble: Moderately deep and deep, rolling to steep, well drained silty clay and silty clay loam over sedimentary rock; on hills
VI	San Joaquin-Cometa: Moderately deep and very deep, level to nearly level, well drained sandy loam and loam; on terraces
VII & VIII	Palls-Stohman: Shallow and moderately deep, rolling to steep, well drained stony sandy loam over igneous rock; on hills
	Ocraig-Palls-Bohna Variant: Very shallow, moderately deep, and very deep, steep to very steep, somewhat excessively drained and well drained very stony coarse sandy loam, stony sandy loam, and sandy loam over igneous rock; on mountains

Figure 9.2-1
Soil Classifications

Based on the SCS classification, 47.6 percent (184,800 acres) of the area of Sutter County would be classified as prime agricultural soils if an adequate and dependable source of irrigation were available. Under the 1989 State Farmland Mapping Project, another 23.5 percent (91,220 acres) has soils of statewide importance. Together, these two soil groups, prime agricultural soils and soils of statewide importance, compose over 71 percent (275,998 acres) of the total area of Sutter County and comprise the most important agricultural lands of the County.

Intensive Agriculture

Intensive agriculture is defined as all agricultural practices involving cultivation of the land for the production of field crops, seed crops, vegetable crops, fruit and nut crops, nursery stock, and apiary (bee keeping) products. Figure 9.2-2 depicts the general area of these activities in Sutter County. This map is based upon the generalization of agricultural activities within the specific areas.

An important point to note is the location of the County's two incorporated cities and the Yuba City Urban Area. These areas are located on soil types that are classified as either prime or of Statewide importance. Of the 275,998 acres that are designated prime or of Statewide importance, approximately 10,500 acres are currently designated for urban uses. As expansion of these urban areas occurs, they will remove more of the best agricultural lands from production.

Extensive Agriculture

Extensive agriculture is defined as animal husbandry forms of agriculture. While this form of agriculture occurs throughout the County, the primary areas where it occurs are depicted in Table 9.2-7.

TABLE 9.2-7

**MAJOR ANIMAL HUSBANDRY
ACTIVITY BY AREA**

AREA	LOCATION AND TYPE OF ANIMAL HUSBANDRY ACTIVITY
Area 1	That area west of the Yuba City Urban Area generally bounded by State Route 20 on the north, Bogue Road on the south, Township Road on the east and the Sutter Bypass on the west; used for dairies.
Area 2	That area in the southeastern portion of the County adjacent to the Placer County line; used for dairies, horse ranches, game birds and cattle ranches.
Area 3	That area in and around the Sutter Buttes; used primarily for cattle and sheep ranches, dairies and horse stables.
Area 4	A small area west of the City of Live Oak along Pennington Road near Schroeder Road; used for dairies.

Agricultural Commodity Values

Tables 9.2-8 through 9.2-12 lists individual, intensive agricultural crop gross production values for 1985, 1990 and 1994. These tables also list acreages for each crop and gross production value for each crop per acre. Table 9.2-13 list the same data by crop groups. Table 9.2-14 notes production values of apiary products for 1985, 1990 and 1994.

TABLE 9.2-8

FRUIT AND NUT CROPS - GROSS PRODUCTION

Fruit and Nut Crops	1985			1990			1994		
	Gross Value Per Acre*	Total Acres	Crop Value	Gross Value Per Acre*	Total Acres	Crop Value	Gross Value Per Acre*	Total Acres	Crop Value
Almonds, Meats & Hulls	\$692	4,933	\$3,335,000	\$1,163	4,299	\$4,998,700	\$1,784	3,687	\$6,577,500
Apples	\$5,688	215	\$1,223,000	\$3,168	411	\$1,302,000	\$4,319	577	\$2,492,000
Bushberries	\$6,470	17	\$110,000	\$3,800	1	\$3,800	\$700	1	\$700
Cherries	\$2,704	23	\$62,200	\$833	33	\$27,500	\$2,306	64	\$147,600
Kiwifruit	\$9,879	232	\$2,292,000	\$8,009	315	\$2,523,000	\$5,903	365	\$2,154,600
Peaches, Cling	\$3,514	9,656	\$33,930,000	\$3,994	7,103	\$28,367,700	\$3,630	8,179	\$29,687,300
Peaches, Freestone	\$7,652	69	\$528,000	\$1,152	86	\$99,100	\$2,326	73	\$169,800
Pears	\$1,733	551	\$955,000	\$2,898	648	\$1,877,800	\$3,473	548	\$1,903,400
Persimmons	N/A	N/A	N/A	N/A	N/A	N/A	\$1,012	177	\$179,100
Plums	\$3,854	48	\$185,000	\$1,206	48	\$57,900	\$1,496	46	\$68,800
Prunes, Dried	\$1,309	17,883	\$23,401,000	\$1,460	20,663	\$30,166,500	\$2,227	26,146	\$58,224,200
Walnuts, English	\$976	12,738	\$12,430,000	\$1,285	14,047	\$18,045,000	\$1,488	17,211	\$25,616,100
Walnuts, Black	\$96	81	\$7,800	\$163	72	\$11,700	\$179	71	\$12,700
Miscellaneous	\$5,393	160	\$863,000	\$897	209	\$187,500	\$1,184	198	\$234,500
Total	(Avg.) \$1,704	46,606	\$79,399,000	(Avg.) \$1,829	47,935	\$87,668,200	(Avg.) \$2,223	57,343	\$127,468,300

Source: Sutter County Crop Report, 1985, 1990 and 1994

TABLE 9.2-9

FIELD CROPS - GROSS PRODUCTION

Field Crops	1985			1990			1994		
	Gross Value Per Acre*	Total Acres	Crop Value	Gross Value Per Acre*	Total Acres	Crop Value	Gross Value Per Acre*	Total Acres	Crop Value
Beans, Dry	\$457	16,245	\$7,420,000	\$461	18,732	\$8,627,800	\$574	12,247	\$7,033,300
Barley	\$213	9,100	\$1,938,000	\$130	4,966	\$643,600	\$148	322	\$47,700
Corn, Field Grain	\$407	7,150	\$2,909,000	\$373	2,200	\$821,400	\$532	2,900	\$1,543,400
Corn, Field Silage	\$715	2,772	\$1,983,000	\$320	3,500	\$1,120,000	\$657	289	\$189,800
Hay, Alfalfa	\$661	4,625	\$3,059,000	\$531	5,610	\$2,978,900	\$632	11,037	\$6,978,200
Hay, Grain	\$146	7,629	\$1,117,000	\$76	3,600	\$275,400	\$45	4,416	\$198,800
Hay, Other	\$44	5,396	\$239,000	\$25	1,743	\$43,600	\$25	2,782	\$69,600
Oats, Grain	\$145	1,500	\$217,000	\$104	2,075	\$215,800	\$239	956	\$228,100
Pasture, Irrigated	\$100	21,500	\$2,150,000	\$100	21,500	\$2,150,000	\$120	21,500	\$2,580,000
Pasture & Range, Dry	\$6	50,000	\$300,000	\$5	50,000	\$250,000	\$6	50,000	\$300,000
Rice	\$476	74,221	\$35,331,000	\$486	69,618	\$33,862,100	\$964	102,589	\$98,882,400
Safflower	\$259	5,335	\$1,383,000	\$264	6,907	\$1,823,500	\$425	7,572	\$3,217,900
Sorghum Grain	\$231	6,797	\$1,572,000	\$225	802	\$180,500	\$253	645	\$162,900
Sugarbeets	\$769	5,790	\$4,455,000	\$931	5,371	\$5,000,400	\$761	3,849	\$2,929,800
Wheat, Grain	\$257	62,700	\$16,139,000	\$250	17,756	\$4,434,600	\$324	21,508	\$6,961,100
Wild Rice	\$1,295	9,067	\$11,742,000	\$806	2,570	\$2,070,900	\$1,555	1,126	\$1,750,900
Miscellaneous	\$955	2,603	\$2,487,000	\$551	1,020	\$561,700	\$760	2,891	\$2,198,600
Field Crop Byproduct	N/A	N/A	\$14,333,000	N/A	N/A	\$610,900	N/A	N/A	\$1,014,600
Total	(Avg.) \$328	292,430	\$95,874,000	(Avg.) \$301	217,970	\$65,671,100	(Avg.) \$553	246,629	\$136,287,100

* Gross values per acre are rounded to nearest dollar.

Source: Sutter County Crop Report, 1985, 1990 and 1994

TABLE 9.2-10

SEED CROP - GROSS PRODUCTION

Seed Crops	1985			1990			1994		
	Gross Value Per Acre*	Total Acres	Crop Value	Gross Value Per Acre*	Total Acres	Crop Value	Gross Value Per Acre*	Total Acres	Crop Value
Alfalfa	\$250	64	\$16,000	N/A	N/A	N/A	N/A	N/A	N/A
Barley	\$339	819	\$278,000	N/A	N/A	N/A	N/A	N/A	N/A
Beans, Dry	\$776	1,833	\$1,423,000	\$362	1,252	\$453,800	\$406	1,172	\$476,400
Cantaloupe, Honeydew	\$530	485	\$257,000	\$1,111	93	\$103,300	\$1,936	177	\$342,600
Corn, Field	\$919	1,575	\$1,447,000	N/A	N/A	N/A	N/A	N/A	N/A
Cucumber	\$802	1,822	\$1,461,000	\$813	1,062	\$863,400	\$675	221	\$149,200
Oats	\$333	147	\$49,000	N/A	N/A	N/A	N/A	N/A	N/A
Pumpkin & Squash	\$1,255	322	\$404,000	\$1,106	344	\$380,500	\$1,636	554	\$906,600
Rice	\$562	3,513	\$1,977,000	\$733	2,125	\$1,558,200	\$960	2,562	\$2,459,500
Safflower	\$270	3,465	\$935,000	\$270	3,710	\$1,002,600	\$369	5,171	\$1,910,400
Sorghum	\$342	430	\$147,000	N/A	N/A	N/A	N/A	N/A	N/A
Sudan	\$197	110	\$21,700	N/A	N/A	N/A	N/A	N/A	N/A
Sunflower	\$935	352	\$329,000	\$500	463	\$231,500	\$506	867	\$438,700
Tomato	\$488	4,088	\$1,995,000	N/A	N/A	N/A	N/A	N/A	N/A
Watermelon	\$724	1,523	\$1,103,000	\$716	989	\$708,200	\$1,065	1,207	\$1,286,000
Wheat	\$466	1,655	\$772,000	N/A	N/A	N/A	\$442	492	\$217,700
Wild Rice	\$2,042	520	\$1,062,000	N/A	N/A	N/A	\$1,000	1	\$1,000
Miscellaneous	\$1,172	87	\$102,000	\$135	4,090	\$552,300	\$79	2,412	\$189,600
Total	(Avg.) \$604	22,810	\$13,778,700	(Avg.) \$414	14,128	\$5,853,800	(Avg.) \$565	14,836	\$8,377,700

* Gross values per acre are rounded to nearest dollar.

Source: Sutter County Crop Report, 1985, 1990 and 1994

TABLE 9.2-11

**VEGETABLE CROP
GROSS PRODUCTION**

	1985			1990			1994		
Vegetable Crops	Gross Value Per Acre*	Total Acres	Crop Value	Gross Value Per Acre*	Total Acres	Crop Value	Gross Value Per Acre*	Total Acres	Crop Value
Corn, Sweet	\$2,366	186	\$440,000	\$948	141	\$133,700	\$737	30	\$22,100
Melons, Honeydew	\$1,618	2,654	\$4,295,000	\$973	3,142	\$3,056,200	\$1,814	5,230	\$9,488,000
Melons, Mixed	\$2,636	867	\$2,285,000	\$1,291	470	\$606,900	\$1,899	492	\$934,500
Pumpkins	\$2,933	685	\$2,009,000	\$613	630	\$386,100	\$823	863	\$710,400
Squash, All	\$4,008	249	\$998,000	\$1,529	461	\$704,900	\$1,426	256	\$365,100
Tomatoes, Canning	\$1,349	15,980	\$21,562,000	\$1,499	16,200	\$24,287,600	\$1,673	21,225	\$35,505,100
Tomatoes, Fresh	\$8,597	77	\$662,000	\$5,469	16	\$87,500	\$5,011	114	\$571,300
Watermelons	\$1,041	871	\$907,000	\$1,590	485	\$771,300	\$1,835	1,020	\$1,872,200
Miscellaneous	\$4,893	375	\$1,835,000	\$2,345	358	\$839,400	\$2,412	402	\$969,600
Total	(Avg.) \$1,592	21,944	\$34,993,000	(Avg.) \$1,410	21,903	\$30,873,600	(Avg.) \$1,702	29,632	\$50,438,300

*Gross values per acre are rounded to nearest dollar.

Source: Sutter County Crop Report, 1985, 1990 and 1994

TABLE 9.2-12
NURSERY PRODUCTS - GROSS PRODUCTION

	1985			1990			1994		
Nursery Products	Gross Value Per Acre*	Total Acres	Crop Value	Gross Value Per Acre*	Total Acres	Crop Value	Gross Value Per Acre*	Total Acres	Crop Value
Fruit and Nut, Trees & Vines	\$40,700	120	\$4,884,000	\$39,498	120	\$4,739,800	\$73,239	120	\$8,788,700
Ornamental Trees & Shrubs	\$17,663	95	\$1,678,000	\$4,011	89	\$357,000	\$3,682	89	\$327,700
Total	(Avg.) \$30,521	215	\$6,562,000	(Avg.) \$24,387	209	\$5,096,800	(Avg.) \$43,619	209	\$9,116,400

*Gross values per acre are rounded to nearest dollar.

Source: Sutter County Crop Report, 1985, 1990 and 1994

TABLE 9.2-13
GROSS PRODUCTION BY CROP GROUP

	1985			1990			1994		
	Gross Value Per Acre*	Total Acres	Crop Value	Gross Value Per Acre*	Total Acres	Crop Value	Gross Value Per Acre*	Total Acres	Crop Value
Fruit and Nut Crops	\$1,575	46,606	\$79,399,000	\$1,829	47,935	\$87,668,200	\$2,223	57,343	\$127,468,300
Field Crops	\$328	292,430	\$99,874,000	\$301	217,970	\$73,152,600	\$553	246,629	\$136,287,100
Seed Crops	\$604	22,810	\$13,778,700	\$414	14,128	\$5,853,800	\$565	14,836	\$8,377,700
Vegetable Crops	\$1,592	21,944	\$34,993,000	\$1,410	21,903	\$30,873,600	\$1,702	29,632	\$50,438,300
Nursery Products	\$215	30,521	\$6,562,000	\$209	24,387	\$5,096,800	\$209	43,619	\$9,116,400
Total	(Avg.) \$566	414,311	\$234,606,700	\$4,163	326,323	\$202,645,000	(Avg.) \$823	392,059	\$322,571,400

* Gross values per acre are rounded to nearest dollar.

Source: Sutter County Crop Report, 1985, 1990 and 1994

TABLE 9.2-14

APIARY PRODUCTS
GROSS PRODUCTION

Apiary Products	1985	1990	1994
Honey	\$99,000	\$85,500	\$96,100
Beeswax	\$5,800	\$5,700	\$4,100
Package Bees	\$580,000	\$40,400	\$46,800
Queen Bees	\$314,000	\$92,800	\$91,800
Pollination	\$257,000	\$831,700	\$292,000
Total	\$1,255,800	\$1,056,100	\$530,800

Tables 9.2-15 through 9.2-17 address extensive agricultural activity for the years 1985, 1990 and 1994. Table 9.2-15 lists livestock and poultry values while Table 9.2-16 lists the value of livestock and poultry related products. Table 9.2-17 summarizes all livestock and poultry related production values.

TABLE 9.2-15

LIVESTOCK AND POULTRY
GROSS PRODUCTION

Livestock & Poultry	1985	1990	1994
Cattle & Calves	\$10,641,000	\$14,645,200	\$8,650,900
Sheep & Lambs	\$2,470,000	\$1,404,400	\$787,600
Hog & Pigs	\$883,000	\$759,600	\$130,500
Rabbits, all	\$391,000	\$348,200	\$12,700
Chickens, all	\$717,000	\$667,800	\$1,300
Miscellaneous	\$5,929,000	\$1,567,300	\$1,206,100
Total	\$21,031,000	\$19,392,500	\$10,789,100

TABLE 9.2-16

**LIVESTOCK AND POULTRY PRODUCTS
GROSS PRODUCTION**

Livestock & Poultry Products	1985	1990	1994
Milk, marketing	\$1,777,000	\$1,090,100	\$103,900
Milk, manufacturing	\$243,000	\$10,900	N/A
Wool	\$273,000	\$190,800	\$45,400
Eggs, Chicken Marketing	\$39,400	\$43,800	\$1,700
Eggs, Chickens, Hatching	\$44,300	\$45,600	N/A
Miscellaneous	\$206,000	\$406,700	\$44,300
Total	\$2,582,700	\$1,787,900	\$195,300

TABLE 9.2-17

**LIVESTOCK AND POULTRY GROUP
GROSS PRODUCTION**

	1985	1990	1994
Livestock & Poultry	\$21,031,000	\$19,392,500	\$10,789,100
Livestock & Poultry Products	\$2,582,700	\$1,787,900	\$195,300
Total	\$23,615,685	\$21,182,390	\$10,986,394

As can be seen from each of the preceding tables of gross production value, the dollar value of each crop varies from year to year depending upon price variables including acreage planted and world market prices.

Additionally, gross production value per acre varies significantly from crop to crop. For example, the 1994 gross production values for apples and kiwi fruit were \$4,319 and \$5,903 per acre, respectively, (with 577 and 365 acres harvested, respectively) while rice (102,589 acres) and dry beans (12,247 acres) had a gross production value of \$964 and \$574 per acre, respectively.

Tables 9.2-8 through 9.2-13 also point to other aspects of farming practices which affect gross production value. Crop changes that occur from year-to-year and over time have altered agricultural practices. From the total acreage as shown in Table 9.2-13, in 1994 the total acreage in production in intensive agriculture in Sutter County was 392,059 acres. Since there are only 388,358 acres of total area in Sutter County, the 392,059 acre figure appears to be in error. What actually occurred in 1994 was that the crops that were planted in that year allowed a substantial volume of double-cropping. No reports are available on the amount of double-cropping that occurred; however, the Census of Agriculture for 1992 indicates that there was about 271,000 acres in Sutter County that were in croplands in 1992. Using this figure as a measure, it appears that as much as approximately 45 percent of the County's agricultural croplands were double-cropped.

Discussions with the Agricultural Extension Service's local office indicated that several of the crops that were produced in the 1970's and early 1980's are either no longer produced in Sutter County or are substantially reduced in total acreage. This change and the lack of a significant volume of cropland is confirmed in part by the draft 1990 Land Use Survey of Sutter County prepared for the State Resource Agency. That report found no significant loss of croplands in Sutter County from 1984 to 1990. Since the report represents a "snap-shot" in time in that it reports agricultural uses on the ground at the time the mapping was completed, the acreage does not double count those fields that were double-cropped.

One additional farm income that should be mentioned is government farm subsidies. The 1992 Census of Agriculture reports that 287 farms in Sutter County received a total of \$11,913,000 in cash and other subsidies from the government. This is an average of \$41,508 per farm. Discussions with the University Extension Service indicated that the bulk of these subsidies were paid for rice crops.

Characteristics of Farm Operations

Farm size is an important agricultural characteristic; however, there are factors other than just size which should be identified in any discussion pertaining to farm characteristics. Table 9.2-18 provides a summary of the number, size and values of farms in Sutter County in 1982, 1987, and 1992.

TABLE 9.2-18

FARMS, LAND IN FARM AND SELECTED ITEMS
1982, 1987 and 1992

	1982	1987	1992
Number of Farms	1,283	1,438	1,362
Total Acreage in Farms	351,907	355,973	318,156
Average size of Farm (acres)	274	248	234
Value of Land and Buildings**			
- Average per Farm - dollars	825,590	554,841	816,122
- Average per Acre - dollars	2,985	2,159	3,448
Estimated Market Value of Machinery and Equipment			
- Average per Farm - dollars	23,528	78,507	78,239
Farms by Size			
1 to 9 acres	231	226	225
10 to 49 acres	418	487	449
50 to 179 acres	282	319	315
180 to 499 acres	171	233	219
500 to 999 acres	95	97	84
1,000 acres or more	86	76	70
Total Cropland			
Number of Farms	1,217	1,369	1,298
Number of Acres	285,185	295,829	270,897
Harvested Acres			
Number of Farms	1,144	1,296	1,243
Number of Acres	247,463	230,996	232,014
Irrigated Land			
Number of Farms	1,155	1,312	1,218
Number of Acres	334,158	212,426	200,646
Market Value of Products Sold			
- Total Products Sold (\$1,000)	166,695	189,294	212,513
- Average per Farm - dollars	129,926	131,637	156,030
- Crops; inc. nursery and greenhouse (\$1,000)	159,380	181,911	207,812
- Livestock, poultry and products (\$1,000)	21,247	7,383	4,701
Farms by Value of Sales			
- Less than \$2,500	147	239	261
- \$2,500 to \$4,999	195	93	85
- \$5,000 to \$9,999	109	122	123
- 10,000 to \$24,999	156	201	173
- \$25,000 to \$49,999	142	170	124
- \$50,000 to \$99,999	160	199	154
- \$100,000 or more	374	414	442
Operators by principal occupation			
- Farming	783	903	850
- Other	500	535	512
Operators by Days Worked off Farm			
- Any	651	720	644
- 200 or more	412	440	387
Average Age of Operator			
- years	51.30	52.50	NR
Total Farm Production			
- Expenses** (\$1,000)	121,236	145,324	166,380
- Average per Farm-dollars	94,494	101,130	122,069

TABLE 9.2-18 CON'T.

	1982	1987	1992
Livestock and Poultry			
- Cattle and calves inventory			
- farms	211	162	129
- number	15,534	11,601	9,354
- Beef cows			
- farms	146	114	102
- number	6,081	4,094	4,215
- Heifers and heifers calves			
- farms	163	123	NR
- number	7,630	5,236	NR
- Milk cows			
- farms	26	18	14
- number	1,549	1,142	473
- Cattle and calves sold			
- farms	180	152	118
- number	9,409	8,217	4,526
- Hogs and Pigs inventory			
- farms	34	26	15
- number	1,297	1,102	D
- Hogs and Pigs sold			
- farms	29	25	12
- number	1,548	1,544	4,379
- Sheep and Lambs inventory			
- farms	50	60	40
- number	21,800	15,020	10,505
- Chickens 3 mo. Old or Older inventory			
- farms	50	44	33
- number	1,103	1,371	411
Selected Crops Harvested			
- Wheat for grain			
- farms	108	129	132
- acres	22,149	21,764	25,746
- bushels	1,331,662	1,715,205	1,787,089
- Corn for grain or seed			
- farms	26	21	NR
- acres	4,594	3,129	NR
- bushels	606,820	383,895	NR
- Rice			
- farms	NR	295	289
- acres	NR	68,430	76,130
- cwt	NR	4,793,549	8,265,614
- Dry edible beans excluding dry limas			
- farms	60	60	NR
- acres	15,230	11,306	NR
- cwt	221,674	164,508	NR
- Sugar beets for sugar			
- farms	NR	19	NR
- acres	NR	8,887	NR
- tons	NR	190,472	NR

TABLE 9.2-18 CON'T.

	1982	1987	1992
- Hay - alfalfa, tame, small grain, wild grass, silage, etc.			
- farms	97	105	100
- acres	8,565	10,569	9,627
- tons - dry	30,766	41,081	47,194
- Vegetable harvested for sale			
- farms	74	78	66
- acres	23,414	23,247	22,829
- Land in Orchards			
- farms	836	905	881
- acres	53,906	59,201	57,479
- Nursery and Greenhouse Crops			
- farms	16	21	NR
- sales (\$1,000)	6,834	56,450	NR

Source: 1982, 1987 and 1992 Census of Agriculture

* - Data for 1982 excludes abnormal farms

** - Data is based on sample of farms

(D) - Not disclosed

(NR) - Not reported

Data from the 1992 Census of Agriculture indicates that the operators of Sutter County farms were as follows: 66.0 percent full owner operated, 17.6 percent were operated by the part-owner, and 16.4 percent were tenant operated. These figures represent a decrease in owner operated farms from the reported 1982 corresponding figures which were 70.9 percent owners, 17.0 percent part-owners, and 12.1 percent tenants. Of the 1,362 farms in Sutter County in 1992, 73.9 percent of them were individual or family owned sole proprietorship farms (1,006 farms), 17.0 percent were owned by partnerships (232), 8.4 percent were owned by corporations (114 farms), and the remaining 0.7 percent were in other forms of ownership (10 farms). Of those farms operated by persons reporting place of residence, 59.6 percent of farm operators lived on the farm that they were operating in 1987.

TABLE 9.2-19**1992 MARKET VALUE OF AGRICULTURAL PRODUCTS**

VALUE RANGE OF FARM PRODUCTS	NUMBER OF FARMS	PERCENTAGE	TOTAL VALUE (\$1,000)	PERCENTAGE
Less than \$1,000	175	12.85	34	.02
\$1,000 to \$2,499	86	6.31	143	.07
\$2,500 to \$4,999	85	6.24	297	.14
\$5,000 to \$9,999	123	9.03	863	.41
\$10,000 to \$19,999	119	8.74	1,661	.78
\$20,000 to \$39,999	134	9.84	3,728	1.75
\$40,000 to \$99,999	198	14.54	12,904	6.07
\$100,000 to \$249,999	236	17.32	37,338	17.57
\$250,000 to \$499,999	119	8.74	41,365	19.46
\$500,000 or more	87	6.39	114,179	53.73
Total	1,362	100.00	212,512	100.00

Source: United States Census of Agriculture, 1992

TABLE 9.2-20**1992 FARM SIZE BY ACREAGE RANGE**

ACREAGE RANGE	NUMBER OF FARMS	PERCENTAGE	TOTAL ACRES	PERCENTAGE
1 to 9 acres	225	16.52	954	.30
10 to 49 acres	449	32.97	10,547	3.32
50 to 69 acres	85	6.24	4,857	1.53
70 to 99 acres	77	5.65	6,231	1.96
100 to 139 acres	76	5.58	8,663	2.72
140 to 179 acres	77	5.65	12,131	3.81
180 to 219 acres	44	3.23	8,817	2.77
220 to 259 acres	35	2.57	8,421	2.65
260 to 499 acres	140	10.28	49,442	15.54
500 to 999 acres	84	6.17	57,128	17.96
1,000 to 1,999 acres	49	3.60	65,255	20.51
2,000 acres or more	21	1.54	85,710	26.94
Total	1,362	100.00	318,156	100.00

Source: United States Census of Agriculture, 1992

The success of Sutter County's agricultural business can be measured in specific economic terms. Table 9.2-19 summarizes information from the 1992 Census of Agriculture by income range for total value of farm products. This table demonstrates that 43.2 percent of all farms in Sutter County accounted for only 1.42 percent of the total value of farm products. These same farms produced less than \$20,000 worth of farm products. Comparison of Tables 9.2-19 and 9.2-20 reveals a correlation between farm size and total value of farm products.

The correlation between farm size and gross productivity is not unexpected. The important distinction is that agricultural parcels that are too small or marginally sized for efficient agricultural production often end up not being intensively farmed. Such parcels regularly become exclusive "ranchette" homesites and may be taken out of production. Many of the marginally sized parcels cannot provide adequate income to sustain the property owner, resulting in the need for outside employment. Undersized parcels cannot benefit from the economy of scale that larger farms enjoy. Generally, parcel size not only correlates to higher gross production but also efficiency. While certain specialty crops can result in high production values, there are limited markets available and saturation can result. Larger scale efficiency translates into a greater potential for increased productivity and long-term commitment to agricultural production. These factors contribute to economic stability and increased revenue from agriculture. The fragmentation through divisions of agricultural land can be seen as a significant threat to the long-term economic health of Sutter County.

In summary, it appears that the County's smaller farms are dividing into still smaller units as more individuals and families look to reside in the rural, agricultural areas of Sutter County; e.g., the number of farms of 50 acres or smaller have increased from 597 in 1978 to 674 in 1992. These smaller farms increase the need for non-farm employment as the farm operator requires either supplemental income for the farm operation and to support his family or, as is becoming more prevalent, the new small farm operator uses the farm as a place of residence while his principal occupation is off of the farm.

9.3 FOREST RESOURCES

Sutter County is primarily an intensive agricultural area. Unlike counties to the north and east, it does not have large and extensive forested areas. The 1992 Census of Agriculture listed Sutter County as having 15,856 acres of woodlands. Of this acreage, virtually the entire amount is in private ownership and is generally in two types of habitat. The first area is the riparian habitats along the Sacramento, Feather and Bear Rivers, the Sutter Bypass and within the Butte Sink area. The second area is the upland terrain around the Sutter Buttes. Some additional stands of oak hardwood also exist throughout the agricultural area, particularly in the area near Live Oak, as remnants of the pre-modern agricultural forests that covered the Sacramento Valley floor.

There are practically no softwood resources and only a few hardwood resources in Sutter County. The primary hardwood trees in Sutter County are the Valley Oak (*Quercus lobata*) and the Blue Oak (*Q. douglasii*). Additionally, the California Department of Fish and Game's Natural Diversity Data Base lists several locations of remaining stands of the Great Valley Riparian Forest containing poplars, box elder, sycamore and other riparian hardwood trees.

The few wood resources that are harvested within Sutter County are used almost entirely for firewood. The primary wood type used for firewood, other than orchards that are removed, is oak, thus leading to the additional loss of the County's remaining oak trees.

"A Planner's Guide for Oak Woodlands" indicates two general varieties of oaks are commonly found in Sutter County. Those varieties are: Valley Oak and Blue Oak. The following summary is taken from that publication:

Valley Oak (Quercus lobata)

Valley oak is found in three types of locations: riparian areas and floodplains, alluvial fans and occasional flat areas, and upland terraces and plateaus. Valley oaks usually grow below 2,000 feet, but where the soil is deep and water is available, it may grow at much higher elevations, up to 5,600 feet.

On the deep soils of well-watered banks and terraces, valley oak form riverine forests and dense woodlands. In these forests and woodlands, valley oak gains height rapidly, and grows tall and straight; most of the tree's branches are clustered at the top.

In the open oak savanna the trees receive less moisture and are less crowded. The savanna oak grow more slowly than in the riverine environs and consequently develop more structure character. Arching branches often reach the ground and the tree takes on a more layered look. Cluster of foliage and weeping branchlets dangle from the outer edges of the canopy. Older trees exhibit large cavities that mark the site of lost branches.

Blue Oak (Quercus douglasii)

Quercus douglasii is the landmark tree of the foothills surrounding California's Central Valley. Blue Oaks flourish in the Sutter Buttes. The common name- blue oak- is based upon the characteristic blue-green color of its leaves. An endemic species, blue oak dominates half of California's oak woodland and savannas. Low rainfall and drought are normal features of these landscapes and during the driest years, blue oak drops its small, tough leaves early to conserve moisture. Blue oak is also tolerant of serpentine soils, a hostile environment for most plants.

Blue oak stands are often characterized as either savanna or woodlands based upon tree density. Savanna, consisting of widely spaced trees, are usually found at lower elevations. Woodlands, more common at higher elevations, differ from savannas in the greater number of trees per acre - more than half of the ground may be shaded by tree canopy.

Blue oaks grow in single species stands for over half of its distribution. In other areas, its most common associate is foothill pine (*Pinus sabiniana*). Other trees found growing with blue oak include coast live oak (*Quercus agrifolia*), valley oak (*Q. lobata*), Garry oak (*Q. garryana*), interior live oak (*Q. wislizenii*), bukeye (*Aesculus californica*) and madrone (*Arbutus menziesii*).

Throughout its range, blue oak is closely identified with ranching and livestock. The acorns and foliage provide nutritional forage for livestock, as well as for deer and other wildlife. Its wood has little commercial value as lumber and the primary uses have been for fencing and fuelwood. In some areas blue oak is still known as post oak. During the Gold Rush Period (circa 1849), blue oak was cut extensively for mining timber and fuelwood. For several decades - the 1950s and 1960s - blue oak was cleared from thousands of acres as part of a federally funded range improvement program. This practice has been discontinued, but blue oak is still harvested for fuelwood.

9.4 MINERAL RESOURCES

The Sutter County Surface Mining Code and the Zoning Code both provide for the extraction of mineral resources from unincorporated lands. The extraction of mineral resources in Sutter County has historically been limited to the extraction of clay, sand, soils and rock. These materials have generally been used for construction; however, at one time, clay was extracted by Gladding-McBean for their Lincoln processing facility to manufacture tile, brick and other clay products. The Gladding-McBean Mine closed some time prior to 1980. Other previous mining sites which have also closed have generally been "borrow sites" for highway or other major construction activities.

Sutter County has no deep-shaft mining activity. All mines in the County are open-pit type which require the possession of a valid surface mining permit and reclamation plan under both the County's Surface Mining Code and the State's Surface Mining and Reclamation Act.

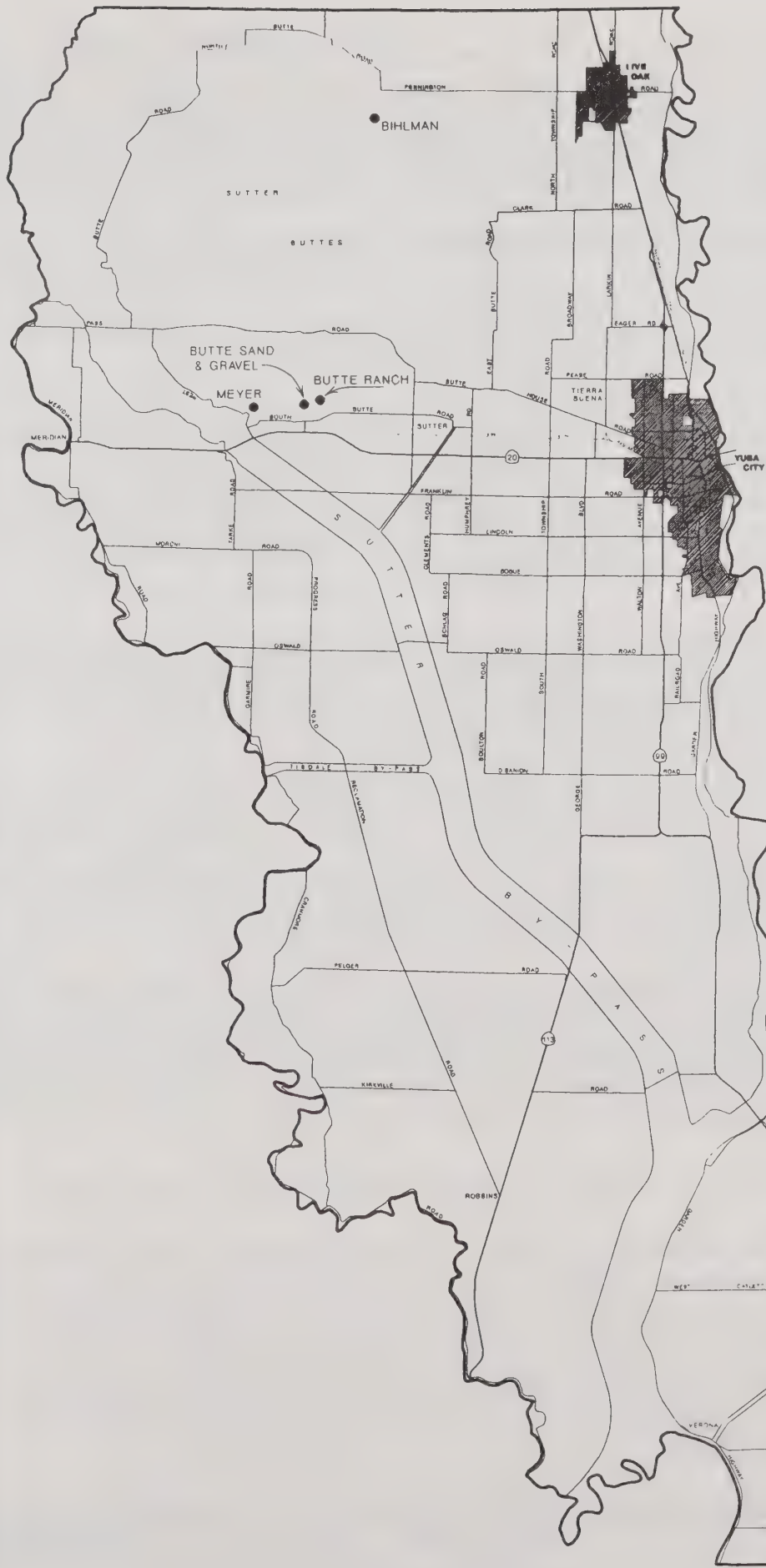
TABLE 9.4-1

1995 PERMITTED SURFACE MINES

MINE/OPERATOR	MATERIAL MINED	YEAR MINE OPENED	AVERAGE ANNUAL YIELD	RESERVES
Gray/Lindeman Brothers, Inc.	Soil	Not Open Yet	N/A	0.4 million cu. yds.
Meyer/Jeffries Construction	Rock	1964	50,000 tons	1.29 million tons
Butte Sand & Gravel	Rock & Sand	1960	220,000 tons	44 million tons
Reclamation District 1001	Soil	1993	<1,000 cubic yards	1.0 million cu. yds.
Justison-Live Oak/Bihlman	Rock & Sand	1980	55,000 tons	3.1 million tons
Butte Ranch/Jaeger Construction	Rock & Sand	1986	10,600 tons	562,850 tons

Four of the permitted mining sites produce either rock and/or sand for construction. These mines have been in operation for at least the last twenty years. Estimates completed in 1982 indicated that based upon annual production yields, there were sufficient reserves in the existing mines to meet local needs for 75 years.

One aggregate material normally produced from these mines is commonly called "Butte Rock". It is a term associated with the materials found in the foothill area of the Sutter Buttes. This material is weathered volcanic rock and is characterized as a good base material due to its compaction and natural cementing capabilities. Butte Rock, however, lacks the strength required for concrete or other high load aggregate uses.



SUTTER COUNTY

SURFACE MINE LOCATIONS



0 10000 20000
SCALE IN FEET

prepared by the
SUTTER COUNTY COMMUNITY SERVICES DEPARTMENT

Figure 9.4-1
Currently Permitted Surface Mine Locations

The two remaining mining sites with valid surface mining permits are both soil borrow sites. The purpose of these mines is to provide soil material for major construction activities; e.g., building the roadbed for Highway 70/99 widening. Both borrow sites or mines will be short-term operations. The Reclamation District 1001 Mine is expected to be completed and reclaimed by the year 2000 while the Gray Mine, which has yet to open, will also probably be completed and reclaimed by then.

River sand and gravel deposits have been identified on the Feather and Bear Rivers. These deposits are the results of mining activity that occurred in the late 1800s and early 1900s in the Sierra gold fields. The material is of good quality for concrete use; however, due to environmental concerns and the ease of other supplies, no mining of this material has been pursued.

In 1986, the California Division of Mines and Geology issued Special Report 132 entitled, "Mineral Land Classification: Portland Cement and Concrete-Grade Aggregate in the Yuba City-Marysville Production-Consumption Area". That report was prepared pursuant to amendments in the State's Surface Mining and Reclamation Act. The report found no significant or substantial deposits located within Sutter County. If the report had found any such deposits, the County would have been required to protect those deposits from conflicting uses.

Special Report 132 did identify significant deposits of aggregate within the Yuba City-Marysville Production-Consumption Area. These deposits were all in Yuba County and generally located in the Yuba Gold Fields area. The report estimated that the 50-year consumption rate for the local area would utilize only two percent of the available aggregate supply.

Changes to the Surface Mining and Reclamation Act now require that all surface mines have financial assurances to guarantee that the property is reclaimed in compliance with the mines' approved reclamation plan. The act requires all mine operators to submit estimates of the reclamation cost. Local government agencies or, in their place, the State Division of Mines and Geology, shall review and approve the proposed estimate upon accepting the amount.

Under the act, without financial assurances in place, a mine can be forced to close. Currently, many mine operators in California do not have financial assurances in place, and the State has amended the financial assurance legislation repeatedly providing inducements to file, penalties for not filing, extension of time to file, revocation of lead agency authority, etc. The responsibilities to administer the financial assurance requirement has placed a burden on already limited local county resources.

As of the spring of 1995, only three mines had approved financial assurance plans in place.

A major problem with the development of financial assurance proposals is that the Act requires that local agencies take the lead in the review and approval of the financial assurance proposals. These proposals are complicated and with only a few mines, Sutter County lacks the technical expertise to evaluate them. Therefore, Sutter County has relied upon the State for assistance in review of the proposals. Given the State's budget problems over the last several years, local assistance has been prioritized with those mines selling material to the State (Caltrans) at the top of the list. To date, State assistance has been limited.

9.5 NATURAL GAS RESOURCES

Natural gas wells were first drilled in Sutter County commercially in the early 1930s. No known record of the total number of wells drilled in the County has been compiled; however, County permit records dating from July, 1973 show that the County has issued permits for a total of 557 gas wells as of March 1, 1994. Many of these wells were either non-producing wells or have since been closed due to declining production; however, some gas wells located in the Sutter Buttes which are still producing were drilled in 1933.

Sutter County produces approximately five percent of all the natural gas produced in the State. In 1992, the County had 252 operational gas wells located in 19 gas fields. Of these wells, 201 were producing wells and 51 were shut-in wells. (A shut-in well is a producing well that has been temporarily taken out of production. These wells may be placed back in production at any time.) Table 9.5-1 lists each gas field that is at least partially located in Sutter County which had 1990 proven acreage (area capable of producing natural gas) in Sutter County while Figure 9.5-1 shows the location of the gas fields. (Production figures and some wells in each gas field may be in adjoining counties.) Those fields not shown in Table 9.5-1 but shown on Figure 9.5-1 are either abandoned or have no proven acreage in Sutter County.

Natural gas production in Sutter County has increased over the last decade. In 1980, wells located in Sutter County produced 12,307,862 mcf (million cubic feet) of natural gas. By 1990, production had increased to 15,744,172 mcf. Additionally, proven natural gas acreage in the County had increased from 23,670 acres to 28,427 acres, primarily with the opening of the Pierce Road Field in 1989. Since 1990, however, the Department of Conservation Division of Oil, Gas, and Geothermal Resources has observed a decrease in new well permits and production figures.

A natural gas well usually encompasses about one acre during well drilling operations. Drilling is an around the clock activity once it commences and usually is completed within 10 to 14 days. After drilling is completed, if the well is successful, the well site is normally reduced to about a quarter of an acre in size and has only periodic, occasional maintenance needs. Near the end of a well's production life, gas production dwindles. In order to boost gas withdrawal with limited labor requirements, compressors are connected to the well in order to increase gas pressure either into a storage tank or collection line. The compressor is usually quite noisy and intrusive.

TABLE 9.5-1
NATURAL GAS FIELDS
1992

FIELD NAME	DATE OF DISCOVERY	WELLS			GAS PRODUCED MCF/D	SUTTER CO PROVEN ACREAGE
		SI	PROD	TOTAL		
Butte Sink	1962	6	4	10	1,172	408
Butte Slough	1955	2	2	4	329	148
Grimes	1960	46	126	172	24,942	11,010
Karnack	1976	2	0	2	329	100
Nicolaus	1961	0	1	1	0	160
Pierce Road	1989	3	8	11	3,985	1,200
Robbins	1980	4	2	6	3,600	346
Sacramento Airport	1973	0	0	0	0	30
Sutter Buttes	1930s	15	52	67	4,600	8,160
Sutter City - Main	1952	4	7	11	354	520
Sutter City - South	1961	9	23	32	5,757	2,890
Sycamore	1957	4	15	19	1,908	1,375
Tisdale	1967	13	8	21	3,728	2,000
Verona	1979	1	0	1	0	40
West Butte	1961	7	0	7	219	40

SI - Shut in well.

PROD - Producing well.

MCF/D - Million cubic feet of gas produced per day.

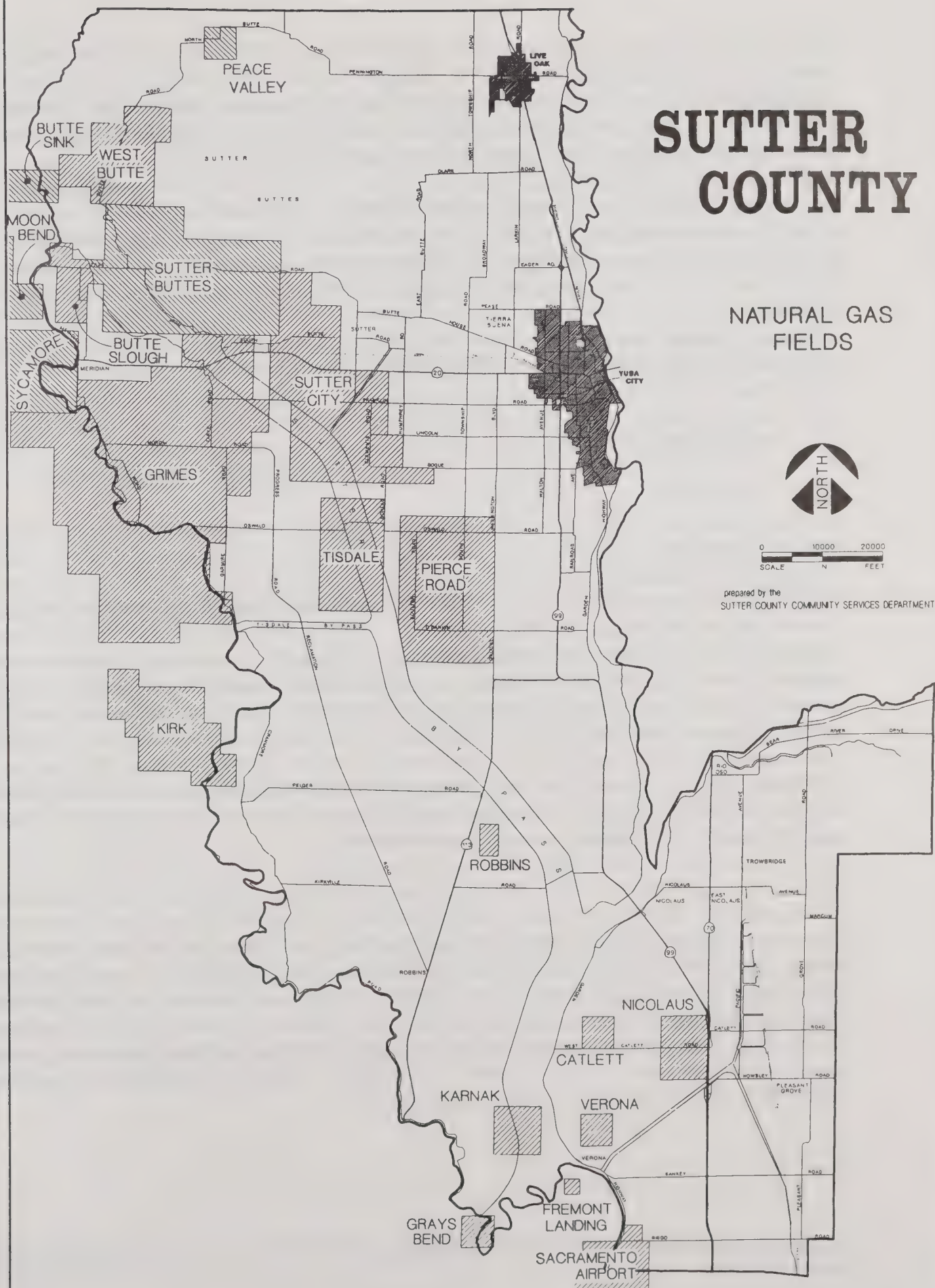


Figure 9.5-1
Natural Gas Fields

Prior to 1984, in order to drill a gas well in Sutter County, the driller needed to first obtain a use permit and complete environmental review. This process usually required four to eight months to complete the regulatory process. Special emphasis was placed upon the compatibility of the natural gas well drilling process and the surface agricultural use of the property. Additionally, all permits were examined as to their effect upon existing residential uses.

Beginning in late-1985, Sutter County implemented a staff review permit procedure for drilling new wells. The drilling permit process cut total County permit processing time to approximately 30 days if all permit requirements could be met. If drilling permit requirements could not be met, the application must proceed under the use permit process. The drilling permit process requires agreement with the surface agricultural operator as well as a minimum 500-foot setback from existing residential uses. Since implementation of the drilling permit process, the County has processed 202 drilling permit applications and only 6 gas well use permits.

9.6 WATER RESOURCES

SURFACE WATER

Regional Overview

Sutter County is generally positioned between the Sacramento River on the west and the Feather River on the east, in the relatively flat Sacramento Valley. Climate in the County is Mediterranean, with moderate, wet winters and warm, dry summers. Late spring to early fall fields a distinct dry season, followed by a wet season from late fall to early spring (October to April). During the wet season, the County receives over 94 percent of its precipitation. There is no significant snowfall in Sutter County and no substantial water storage reservoirs; therefore, all rainfall is either absorbed into the ground, runs off into the area's streams and/or rivers, or is eventually evaporated back to the atmosphere. By late summer, most small creeks and streams are generally dry and the rivers are at their lowest levels. Some small creeks have water during the dry season due to agricultural irrigation and drainage and due to drainage of upstream urban areas.

Sutter County lies entirely within the Sacramento River watershed. The County's most notable hydrological features are the Sacramento River, the Feather River and the Bear River. Other notable features are Coon and Pleasant Grove Creeks and Markham and Auburn Ravines in the southeastern portion of the County and the Snake River on the east side of the Sutter Buttes. A manmade feature is the Sutter Bypass which acts as a flood control overflow for the Sacramento River. The Sutter Bypass collects flood overflow water from the Sacramento River after passing through Butte Slough and the Butte Sink. The Bypass starts north of Pass Road, westerly of the Sutter Buttes and generally goes in a south-southeast direction for about 27 miles until it intercepts the Feather River about three miles downriver from the rural community of Nicolaus.

Existing Resources

Sacramento River. The Sacramento River is the largest river in the County and in the State. It forms a major portion of the western County boundary as it enters the County from Colusa County on the west and generally flows in a south-southeasterly direction until it leaves the County at the Sacramento County boundary. The river supports various recreational activities, agricultural irrigation and diverse wildlife habitats. No communities in Sutter County use the river as a source of domestic or municipal water supply. Historically, the river has been known to meander, and has carved out a wide floodplain outside of its existing banks. In an effort to protect the adjoining lands, a levee system has been developed along both sides of the river.

The State Department of Water Resources, Division of Water Resources, established the Sacramento River Flood Control Project which implements flood protection programs for the river and its tributaries. During the high water period of 1983 and the floods of 1986, the river threatened Sutter County with possible flooding due to levee failure. After the 1986 floods, the levee system was re-evaluated and improvements begun. The upper portion of the river is controlled by Shasta Dam, Whiskeytown Dam and Keswick Dam.

Feather River. The Feather River forms a major portion of the County's eastern boundary. Like the Sacramento River, the Feather River provides for recreation activities, agricultural irrigation and a diverse wildlife habitat. The City of Yuba City obtains a large part of its annual water supply for municipal and domestic use from the River.

Sutter County is protected from flooding from the Feather River by a levee system that has known historical flooding, the most recent event being the 1955 Yuba City Flood when 39 people died and thousands of homes and other buildings were damaged or destroyed. The river is part of the Sacramento River Flood Control Project managed by the State Department of Water Resources.

The river is listed as navigable below the City of Yuba City, however, due to siltation caused by past mining practices in the Sierra foothills and to lack of maintenance, only small boats can pass. Sand deposits within the river have some potential for mining, however, due to environmental concerns are probably impractical until the value of sand reaches a much higher level. Upstream, the river is controlled by the Oroville Dam in Butte County.

Bear River. The Bear River enters Sutter County from Placer County near the City of Wheatland in Yuba County. It generally flows in a south-southwest direction until it meets the Feather River about one mile upstream from the rural community of Nicolaus. Although smaller than either the Sacramento or Feather Rivers, the Bear River also provides recreational opportunities, agricultural irrigation water and a diverse wildlife habitat. River flows are controlled by the Camp Far West Reservoir in Yuba County.

GROUNDWATER RESOURCES

Sutter County lies within the Sacramento Valley groundwater basin. Major hydrologic features of the County include the Sacramento River, which forms the western border of the County, the Feather River, which forms a portion of the eastern boundary, and the Bear River, which forms the border in the southeastern part of the County between Yuba County and Sutter County. The Sutter Buttes lie between the Sacramento River and Feather River in the northern part of the County and represents a barrier to groundwater flow. The rivers are sources of groundwater recharge. Other sources include deep percolation of precipitation and water applied for agriculture, and subsurface inflow from adjacent areas of the Sacramento Valley. Groundwater discharge from Sutter County results from pumping and subsurface outflow to rivers and adjoining areas of the Sacramento Valley.

Two main groundwater flow patterns exist in Sutter County. West of the Feather River, groundwater flows from north to south at a relatively flat gradient. The general direction of groundwater flow and the depth to groundwater have remained somewhat stable since the mid-1940s. Spring groundwater levels range from about 60 to 70 feet above mean sea level near the northern border of the County and from 10 to 20 feet above mean sea level near the southern border. During wet years, groundwater will be near the ground surface in most of the flatter areas of the County.

The other main groundwater flow pattern is in the southeastern portion of the County, east of the Feather River. Groundwater in this portion of the County flows primarily from east to west, towards the Feather River. The gradient and direction of groundwater flow have changed over time in response to regional pumping depressions in adjacent counties. The highest historical groundwater elevations have ranged from 60 feet above mean sea level in the eastern portion of the County, adjacent to Placer County, to 30 feet below mean sea level in the southeastern portion of the County, adjacent to Sacramento County.

Agricultural demands on groundwater caused declining groundwater levels in the southeastern portion of Sutter County from the mid-1940s to about the mid-1960s. After surface water supplies from Camp Far West were substituted for groundwater in 1964, groundwater levels began to recover and reach near historical high levels by the late-1960s. Groundwater levels remained at about this level until 1977, when surface supplies were interrupted by the drought and agriculture again relied on groundwater to meet irrigation demands. Following that drought, groundwater levels again recovered to near their high. In response to the drought that began in the late 1980s, groundwater levels have again declined, but not as low as during the mid-1970s drought.

Groundwater levels and flow patterns in Sutter County are also influenced by pumping in adjacent counties. A pumping depression in Yuba County affects groundwater levels along the eastern border of Sutter County. Pumping depressions in Placer and Sacramento Counties that have developed in the 1950s have continued to widen and deepen. These pumping depressions have lowered groundwater levels in the southeastern corner of Sutter County, steepening the gradient and diverting the direction of groundwater flow to the southeast. Similar effects have been observed in the southwestern portion of Sutter County due to pumping in Yolo County, but this depression and its effects are not as deep or as persistent as those in Sacramento and Placer Counties.

Only one persistent pumping depression has existed since the county-wide groundwater monitoring program was started during the mid-1940s. This deep depression is centered south of Yuba City and was deepest and widest during the drought of the mid-1970s, when it was partially connected to the deep pumping depression to the east, in Yuba County. Groundwater levels recovered during the wetter years of the late 1970s and early 1980s, but have declined once again by 5 to 10 feet as a result of the drought that began in the late 1980s. Department of Water Resources maps of irrigated crop lands from 1970 correspond to this depression south of Yuba City and the generalized area of orchard crops.

In 1961, reports prepared by the U.S. Geological Survey in cooperation with the California Department of Water Resources analyzed major agricultural irrigation wells in the Sacramento Valley. With the exception of the Sutter Buttes Area, which was not tested, and that area along the Sacramento River north of Fasig Road, major agricultural wells in Sutter County were generally able to produce an average of from 730 to 960 gpm (gallons per minute) with average depths from 252 to 303 feet. Wells tested in the area along the Sacramento River, north of Fasig Road, produced an average of 1,690 gpm at an average depth of 315 feet.

The 1961 analysis of groundwater found only two substantial changes in groundwater depth from a 1912 survey which was considered to be natural conditions. The first change was the area south of Yuba City which had a depression of up to twenty feet. The second area was the area of southeast Sutter County which had a depression of up to thirty feet.

Information pertaining to the quality of groundwater and existing areas of groundwater contamination are discussed within Section 5.3 of this report.

Groundwater Recharge

During the period of 1961 to 1970, it is estimated that approximately 193,000 acre feet of groundwater was pumped annually in Sutter County. During this same period, with area rainfall slightly less than normal throughout the Sacramento Valley, groundwater basin supplies underlying the County increased by approximately 10,500 acre-feet. This increase was as a result of recharge of the groundwater basin.

The major sources of groundwater recharge in Sutter County are rainfall, infiltration from streams, subsurface inflow, and deep percolation of applied irrigation water in agricultural areas. The 1961 to 1970 study by the U.S. Geological Survey and Department of Water Resources was not able to separate what portion of groundwater recharge was individually provided by rainfall and inflow. However the study did estimate applied water percolation reaching the groundwater and found it to be almost 79,000 acre-feet annually. (Applied water is agricultural irrigation water that reaches the groundwater.)

Depending upon various area locations, Sutter County averages from 17 to 21 inches of rainfall per year. On an average, that means that slightly more than one-half million acre-feet of rainfall occurs in Sutter County. No estimate of what percentage of this reaches the groundwater exists; however, based upon the "balancing the equation" method used in the 1961 to 1970 study, the combined amount of rainfall and inflow from surrounding streams reaching groundwater in Sutter County is estimated to be 124,500 acre-feet of water.

Regulatory Setting

Criteria for dischargeable allowances into groundwater in Sutter County have been developed by the State Water Quality Control Board, Division of Water Quality. These requirements are used as criteria in granting National Pollutant Discharge Elimination System (NPDES) permits. Any facility or activity that will discharge waste that may affect groundwater quality must obtain waste requirements which serve as a federal NPDES permit. The Regional Water Quality Control Board evaluates an NPDES permit application to determine whether the proposed discharge is consistent with the adopted water quality objectives, the Areawide Waste Treatment Management ("208") Plan and the federal effluent limitations.

With the droughts that have occurred in the 1970s and 1980s, local groundwater resources are being examined more closely. Some concern has been expressed in the northern California, water-rich counties that southern California interests may attempt to force the replacement of riparian water rights with the use of groundwater.

With the exception of a few groundwater management districts and a few "adjudicated" groundwater basins, there is little control over the use and/or potential sale of local groundwater. Many California landowners, public or private, can extract as much groundwater as they choose - as long as the water is put to a "beneficial use" and regardless of the impact such extraction has on neighboring groundwater extractors. The State of California is not authorized by the State Water Code to manage groundwater. However, in basins or sub-basins where groundwater extraction, recharge, or quality are being managed, such programs have developed solely on an "ad hoc" basis at the local level in response to local initiative. Management of groundwater at the local level is accomplished by two approaches: 1) adjudicated basins and 2) water districts or agencies.

Adjudicated groundwater basins are areas where the residents have approached the courts and had the courts limit all parties within the basin subject to the court's judgment. Adjudicated groundwater basins are used where a groundwater basin is narrowly restricted with limited available water supplies and has numerous demands upon that water.

In the eight groundwater management districts or agencies that exist, local parties have lobbied their State legislators to create special legislation to control the use of the groundwater in their area. Some districts or agencies which import water for recharge have only been given the authority to charge for groundwater extraction. Legislation that formed most of the eight districts or agencies that exist was successful only after several years. Adoption of a generic groundwater management district in the State Water Code may make the process simpler.

9.7 AIR QUALITY

INTRODUCTION AND PURPOSE OF AIR QUALITY BASELINE REPORT

This report contains background information that describes the effects of topography, climate, and meteorology on air quality; explains the relevant state and federal ambient air quality standards; describes recent ambient air quality conditions in Sutter County; explains air quality management programs and policies; and identifies air pollution causes and expected air quality trends in Sutter County.

REGIONAL TOPOGRAPHY, CLIMATE, AND METEOROLOGY

The climate of Sutter County, as of all central California, is dominated by the strength and position of the semipermanent high-pressure cell over the Pacific Ocean north of Hawaii. In summer, when the high-pressure cell is strongest and farthest north, temperatures are high and humidity is low, although the incursion of the sea breeze into the Central Valley helps moderate the summer heat. Summer temperatures average approximately 90°F during the day and 50°F at night.

In winter, when the high-pressure cell is weakest and farthest south, conditions are characterized by occasional rainstorms interspersed with stagnant and sometimes foggy weather. Winter daytime temperatures average in the low 50s and nighttime temperatures are mainly in the upper 30s. Rainfall, which occurs almost exclusively from late October to early May, averages 17.2 inches per year, but varies significantly from year to year.

During summer, prevailing winds are from the south. This is primarily because of the north-south orientation of the valley and the location of the Carquinez Strait, a sea-level gap in the coast range mountains that is southwest of Sutter County. During winter, atmospheric conditions cause north winds to become more frequent, but winds from the south still predominate.

In addition to prevailing wind patterns that control the rate of dispersion of local pollutant emissions, Sutter County experiences two types of inversions that affect the vertical depth of the atmosphere through which pollutants can be mixed. In summer, sinking air forms a "lid" over the region. These subsidence inversions contribute to summer photochemical smog problems by confining pollution to a shallow layer near the ground.

In the second type of inversion, the air near the ground cools by radiative processes while the air aloft remains warm. These inversions typically occur during winter nights and can cause localized air pollution "hot spots" near emission sources because of poor dispersion. Although these subsidence and radiative inversions are present throughout much of the year, they are much less dominant during spring and fall, and the air quality during these seasons is generally good.

Sutter County is part of the Sacramento Valley Air Basin (SVAB). The SVAB consists of the northern half of the Central Valley and approximates the drainage basin for the Sacramento River and its tributaries. The SVAB is bounded on the west by the Coast Range, on the north by the Cascade Range, on the east by the Sierra Nevada, and on the south by the San Joaquin Valley Air Basin. The SVAB consists of the counties of Butte, Colusa, Glenn, Sacramento, Shasta, Sutter, Tehama, Yolo, and Yuba and portions of Placer and Solano Counties.

FEDERAL AND STATE AIR QUALITY STANDARDS

Both the State of California and the federal government have established ambient air quality standards for several different pollutants (Table 9.7-1). For some pollutants, separate standards have been set for different time periods. Most standards have been set to protect public health. For some pollutants, standards have been based on other values, such as protection of crops, protection of materials, or avoidance of nuisance conditions.

Air quality monitoring has been conducted within the SVAB for the last decade. The monitoring results have shown that the principal pollutants of the SVAB, including Sutter County, are ozone and particulate matter.

Ozone Standards

State and federal standards for ozone have been set for a 1-hour averaging time. The state 1-hour ozone standard is 0.09 parts per million (ppm), not to be exceeded. The federal 1-hour ozone standard is 0.12 ppm, not to be exceeded more than three times in any 3-year period.

Ozone is a public health concern because it causes eye and respiratory irritation and infections. Ozone can cause significant damage to leaf tissues of crops and natural vegetation and can damage many materials by acting as a chemical oxidizing agent.

Ozone is of concern primarily during summer, when high temperatures, the presence of sunlight, and an atmospheric inversion layer induce photochemical reactions. Photochemical reactions convert ozone precursor emissions into ozone. Ozone precursors include two general classes of chemical compounds: reactive organic gases (ROG) and oxides of nitrogen (NO_x).

**Table 9.7-1
Ambient Air Quality Standards Applicable in California**

Pollutant	Symbol	Averaging Time	Standard, as parts per million		Standard, as micrograms per cubic meter		Violation Criteria	
			California	National	California	National	California	National
Ozone	O ₃	1 hour	0.09	0.12	180	235	If exceeded	If exceeded on more than 3 days in 3 years
Carbon monoxide	CO	8 hours	9.0	9	10,000	10,000	If exceeded	If exceeded on more than 1 day per year
(Lake Tahoe only)		1 hour	20	35	23,000	40,000		
		8 hours	6	--	7,000	--		
Nitrogen dioxide	NO ₂	Annual average	--	0.053	--	100	If exceeded	If exceeded
		1 hour	0.25	--	470	--		
Sulfur dioxide	SO ₂	Annual average	--	0.03	--	80	If exceeded	If exceeded If exceeded on more than 1 day per year
		24 hours	0.04	0.14	105	365		
		1 hour	0.25	--	655	--		
Hydrogen sulfide	H ₂ S	1 hour	0.03	--	42	--	If equaled or exceeded	
Vinyl chloride	C ₂ H ₃ Cl	24 hours	0.010	--	26	--	If equaled or exceeded	
Inhalable particulate matter	PM10	Annual geometric mean	--	--	30	--	If exceeded	If exceeded If exceeded on more than 1 day per year
		Annual arithmetic mean	--	--	--	50		
		24 hours	--	--	50	150		
Sulfate particles	SO ₄	24 hours	--	--	25	--	If equaled or exceeded	
Lead particles	Pb	Calendar quarter	--	--	--	1.5	If equaled or exceeded	If exceeded on more than 1 day/ year
		30 days	--	--	1.5	--		

Notes: All standards are based on measurements at 25° C and 1 atmosphere pressure.
National standards shown are the primary (health effects) standards.

Particulate Matter Standards

State and federal standards for inhalable particulate matter have been set for two time periods: a 24-hour average and an annual geometric mean of the 24-hour values. Until recently, the federal and state particulate matter standards applied to a broad range of particle sizes. The high-volume samplers used at most monitoring stations were most effective in collecting particles smaller than 30 microns (one micron is about 0.00004 inch in diameter) (Powell 1980). Health concerns associated with suspended particles focus on those particles small enough to reach the lungs when inhaled. Few particles larger than 10 microns in diameter reach the lungs. Consequently, both the federal and state air quality standards for particulate matter have been revised to apply only to these small particles (generally designated as PM10).

The state PM10 standards are 50 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$) as a 24-hour average and 30 $\mu\text{g}/\text{m}^3$ as an annual geometric mean. The federal PM10 standards are 150 $\mu\text{g}/\text{m}^3$ as a 24-hour average and 50 $\mu\text{g}/\text{m}^3$ as an annual arithmetic mean.

EXISTING AIR QUALITY CONDITIONS IN SUTTER COUNTY

The California Air Resources Board (ARB) publishes summaries of air quality monitoring data from locations throughout the state (California Air Resources Board 1994). Table 9.7-2 shows a summary of the monitoring data for ozone and PM10 in Sutter County. The remaining pollutants shown in Table 9.7-1 are not monitored in Sutter County.

Ozone

Two ozone monitoring stations are located in Sutter County: Pleasant Grove and Yuba City - Almond Street. Data from these stations indicate that the state standard of 0.09 ppm has been exceeded from 1 to 29 days during each of the 5 most recent years for which data are available, while the less stringent federal standard of 0.12 ppm has been exceeded only 2 days in 5 years. The highest 1-hour concentration recorded over the past 5 years was 0.15 ppm, recorded in 1988. No exceedances of the federal ozone standard have been recorded in Sutter County during the most recent 4 years for which monitoring data are available.

Particulate Matter

PM10 monitoring in Sutter County has been conducted at the Yuba City Almond Street station and in Pleasant Grove. Data recorded from the Yuba City station show that the state 24-hour standard of 50 $\mu\text{g}/\text{m}^3$ has been exceeded from 5 to 22 times in each of the last 4 years, while the less stringent federal standard of 150 $\mu\text{g}/\text{m}^3$ has not been exceeded during this period. The state annual geometric mean of 30 $\mu\text{g}/\text{m}^3$ has been exceeded in each of the last 4 years, but the federal annual arithmetic mean has been exceeded only once in the last 4 years.

TABLE 9.7-2

SUMMARY OF SUTTER COUNTY AMBIENT AIR QUALITY MONITORING DATA

Pollutant	Monitoring Station	State Standard	Federal Standard	1991	1992	1993	1994
Ozone							
<u>Pleasant Grove</u>							
Days above state standard				7	12	4	1
Days above federal standard				0	0	2	0
Maximum 1-hour concentration		0.09 ppm	0.12 ppm	0.10	0.12	0.14	0.09
<u>Yuba City - Agriculture Dept.</u>							
Days above state standard				No Data	No Data	No Data	No Data
Days above federal standard							
Maximum 1-hour concentration		0.09 ppm	0.12 ppm				
<u>Yuba City - Almond Street</u>							
Days above state standard				5	23	1	12
Days above federal standard				0	0	0	0
Maximum 1-hour concentration		0.09 ppm	0.12 ppm	0.11	0.12	0.10	0.11
PM10							
<u>Yuba City - Almond Street</u>							
Days above state standard				22	13	11	10
Days above federal standard				0	0	0	0
Annual geometric mean		30 g/m ³		34.6	31.4	28.3	31.1
Annual arithmetic mean				41.1	35.6	32.3	35.7
24 hour high		50 g/m ³		108	79	78	81

Source: California Air Resources Board 1991 through 1994, Air Quality Data Summary

AIR QUALITY MANAGEMENT PROGRAMS AND POLICIES

Air quality in Sutter County is regulated by federal, state, and local laws, regulations, and policies. The Federal Clean Air Act of 1990 is intended to bring areas into compliance with the federal ambient air quality standards shown in Table 9.7-1.

The California Clean Air Act of 1988, updated in 1991, is designed to bring areas currently in violation of the California ambient air quality standards for ozone and carbon monoxide (also shown in Table 9.7-1) into compliance with those standards. Plans are not currently required for areas that violate the state PM10 standards.

For carbon monoxide, Sutter County is designated as unclassifiable/attainment under federal standards and unclassified under state standards. Sutter County is in attainment for state and federal sulfur dioxide and nitrogen dioxide standards. As shown in Table 9.7-3, Sutter County is also an attainment area for the federal PM10 standards but a non-attainment area for the California PM10 standards.

Sutter County is a non-attainment area for the California ozone standards. For the federal ozone standards, Sutter County has two designations. Sutter County south of Subaco Road is in severe non-attainment for the federal standards, and Sutter County north of Subaco Road is classified as "transitional". The transitional classification indicates that the area has not violated the federal ozone standards during the past 3 years but has not been redesignated as a federal ozone attainment area.

Federal Air Quality Programs

As a result of the Federal Clean Air Act of 1990, the U.S. Environmental Protection Agency (EPA) enlarged the boundaries of the Sacramento Air Quality Maintenance Area (AQMA) non-attainment area to include Sutter County south of Subaco Road (see Figure 9.7-1). The southern portion of Sutter County was added because of population growth projections associated with proposed land development in that area.

The Federal Clean Air Act of 1990 contained several requirements for ozone non-attainment areas. These include the preparation of a rate of progress plan and a state implementation plan (SIP). The rate of progress plan is a compendium of control measures that are being or will be implemented to reduce ROG by 15% during the 6-year period from 1990 to 1996.

Each air district within the AQMA, including the Feather River Air Quality Management District (FRAQMD), submitted its rate of progress plan to ARB in November 1993. Since the FRAQMD falls within two separate ozone non-attainment conditions, the District is addressed in two separate SIP's. In 1994, a SIP for the Sacramento Air Quality Management Area (including southern Sutter County) was prepared and accepted. A second SIP that will include Sutter County north of Subaco Road is expected to be submitted in April of 1996.

State Air Quality Programs

Areas that violate the state ozone or carbon monoxide standards are required to prepare air quality attainment plans describing the steps that will be taken to attain the standards. Those plans must either contain measures to reduce air emissions by 5% per year (using 1987 as the base year) or include all "feasible" mitigation measures.

The 1991 Air Quality Attainment Plan (AQAP), applicable to Sutter County, was prepared by several air districts within the SVAB, including the FRAQMD. The AQAP contains stationary-, area-, and mobile-source control measures designed to bring the area into compliance with the state ozone standards. The California Clean Air Act requires that these plans be updated every 3 years. The next update is scheduled for completion by the end of 1994 and is essentially a status report describing the progress that has been made in meeting the state ozone standards and additional steps that need to be taken.

Local Air Quality Programs

Local air quality programs can be divided into two categories. The first category includes the rules and regulations promulgated by the FRAQMD, which limit emissions from stationary, area, and mobile sources in both Sutter and Yuba Counties. The second category includes general and specific plan policies and objectives that indirectly affect air emissions. In Sutter County, the most relevant document is the Sutter County General Plan.

Air Quality Status

Tables 9.7-3 and 9.7-4 identify the status of Sutter County's air quality for ozone and PM 10. The significance of non-attainment status is considered further in the following discussion.

Sutter County south of Subaco Road (see Figure 9.7-1) is considered part of the Sacramento Air Quality Maintenance Area. Air quality within this area is generally lower than in Sutter County. However, since lands south of Subaco Road have been included within the Management Area, the southern portion of the County is subject to more stringent area quality controls.

TABLE 9.7-3

**SUTTER COUNTY AIR QUALITY STATUS
SOUTH OF SUBACO ROAD
(Sacramento Air Quality Management Area)**

Pollutant	Federal Standard	California Standards
Ozone	Severe Non-Attainment	Serious Non-Attainment
PM 10	Attainment	Moderate Non-Attainment

TABLE 9.7-4**SUTTER COUNTY AIR QUALITY STATUS
NORTH OF SUBACO ROAD**

Pollutant	Federal Standard	California Standards
Ozone	Transitional Non-Attainment	Moderate Non-Attainment
PM 10	Attainment	Moderate Non-Attainment

Impacts of Air Quality Designations

Areas which are designated as non-attainment for a state or federal standard (areas exceeding the standards) are subject to requirements for new land uses or modification of existing land uses which will contribute to the non-attainment condition. Non-attainment levels are designated based upon the degree to which the standards are exceeded, with designations of transitional, moderate, serious and severe non-attainment applied within Sutter County.

As the level of non-attainment increases (e.g. air quality decreases) the threshold at which new or modified land uses are subject to pollution control restrictions is lowered. These restrictions take the form of requirements which must be met for the local Air Quality Management District to issue a Permit to Operate. Permits are required for stationary air pollution sources such as new or expanding industrial or commercial land uses which will contribute to existing conditions of non-attainment of state or federal air quality standards.

Two types of requirements are imposed on land use changes which result in increased air pollution: Best Available Control Technique (BACT) and Offsets. BACT requirements include use of equipment and modification of industrial activities and processes to reduce emissions. Offsets refer to a requirement to reduce emissions of pollution generators outside the project area. Offsets can be achieved by reducing emissions at another site owned by the project applicant or by purchasing "banked credits" from businesses that have previously reduced emissions to levels below standards and have received credits which can then be sold and transferred. Thresholds for BACT and Offset requirements on ozone and PM 10 generators are described below in Tables 9.7-5 and 9.7-6. In the case of ozone, the thresholds refer to generation of ozone precursors such as nitrogen oxides and reactive organic gases. These precursors are converted into ozone through a photochemical reaction.

TABLE 9.7-5**REQUIREMENTS FOR OZONE CONTRIBUTING LAND USE CHANGES**

Authority	Level of Non-Attainment	Threshold Level	Required Control
State	Moderate	25 lbs/day 25 tons/year	BACT Offsets
	Serious	10 lbs/day 15 tons/day	BACT Offsets
Federal	Transitional	100 tons/year	BACT
	Severe	25 tons/year	BACT

TABLE 9.7-6**REQUIREMENTS FOR PM 10 CONTRIBUTING LAND USE CHANGES**

Authority	Level of Non-Attainment	Threshold Level	Required Control
State	Moderate	80 lbs/day 25 tons/day	BACT Offsets

FIGURE 9.7-1

**FEDERAL AIR QUALITY PLANNING BOUNDARIES FOR
THE SACRAMENTO AIR QUALITY MAINTENANCE AREA**



CAUSES OF AIR QUALITY PROBLEMS IN SUTTER COUNTY

Transport of Pollutants from Upwind Areas

In May 1992, ARB changed the Broader Sacramento Area (BSA)/Upper Sacramento Valley (USV) boundary. As a result, the northern two-thirds of Sutter County is now part of the USV rather than the BSA. A recent ARB report analyzed whether ozone violations in the USV, including northern Sutter County, were caused by the transport of emissions originating in the BSA. The ARB report described three classes of ozone transport: inconsequential, significant, and overwhelming. Inconsequential transport refers to emissions that do not contribute to ozone violations in downwind areas; violations are caused solely by local sources. Significant transport refers to situations in which ozone violations are caused by a combination of both upwind and local sources. Overwhelming transport occurs when ozone violations are caused entirely by the transport of pollutants from upwind sources. (California Air Resources Board 1993b.)

The ARB report classified certain ozone violations in the USV, including Sutter County, as overwhelming because of the transport of pollutants from the BSA. ARB has recommended that upwind areas that cause overwhelming transport adopt sufficient control measures to attain the ozone standard within the affected area. Consequently, each BSA air district must include sufficient measures in its air quality plan to demonstrate expeditious attainment of the state ozone standard in the USV, including the northern two-thirds of Sutter County. As one example, each BSA air district must ensure that all permitted stationary sources of ROG and NO_x emissions install best available retrofit control technology. (Air Resources Board 1993b.)

AIR QUALITY MODELING METHODOLOGY

The air quality programs used for the Sutter County General Plan EIR are found within the third edition of Air Quality Analysis Tools (AQAT-3). This package of tools, described below, estimate the emission impact of general development projects, of associated mitigation measures, and of roadway traffic.

The three models used within the analysis include:

URBEMIS #3: This model is used to quantify emissions resulting from increased automobile traffic from new or modified land uses. This model considers the number of vehicle trips generated and vehicle miles traveled for each type of trip taken, and is used to estimate carbon monoxide, total hydrocarbon and nitrogen emissions from those vehicle trips.

EMFAC7PC: This model uses the most current assumptions for estimating and projecting emissions from motor vehicles. The model allows a personal computer to quickly estimate pollutant factors, given a vehicle fleet mix, year, temperature and operating speeds. The output from EMFAC7PC can be used as input to CALINE4.

CALINE4: This is a Gaussian diffusion air quality model developed by the California Department of Transportation and adapted for the IBM PC by Air Resources Board staff. The model estimates ambient pollutant concentrations resulting from automobile emissions on a roadway segment, intersection or parking lot.

South Coast A.Q.M.D. CEQA Handbook: This handbook is an established reference document used by many Air Quality Management Districts within California. The guidelines of this handbook were used to quantify construction related air quality impacts.

9.8 BIOLOGICAL RESOURCES

INTRODUCTION

The purpose of this profile report is to summarize available current information on the known biological resources of Sutter County, and to present an evaluation of those resources. This report is not intended to be a list of all plant and animal species occurring in Sutter County, but rather a document to alert the County to unique and valuable areas of biodiversity and habitat value within Sutter County. This is a planning tool. As such a tool, it should not be a static document, but should be periodically updated. Environmental circumstances change rapidly, and this profile represents a snap shot in time of current conditions in Sutter County.

BRIEF HISTORICAL OVERVIEW OF SUTTER COUNTY BIOLOGY

Sutter County, in the flat southern Sacramento Valley, sits on alluvial plain soils deposited by the Sacramento, Feather, and Bear Rivers. Originally, the fertility of these soils was renewed annually with naturally occurring winter floods. Immense wetlands supported vast numbers of waterfowl and other wildlife. A well-known outstanding geologic (and biological) feature of Sutter County is the Sutter Buttes, a system of mountains in the middle of the valley floor that were created by volcanic activity over a million-year-long period starting 2 ½ million years ago (Hausback and Nilsen, 1991).

Prior to the arrival of European peoples, Sutter County supported abundant waterfowl, wetland and grassland natural resources. Around 1832, trapping parties arrived to hunt local furbearing species and elk herds. These trappers brought diseases that greatly reduced the local Native American populations.

John Sutter's arrival in 1839 marked the first use of agriculture in Sutter County. He began to graze sheep on the Buttes. This new land use, which continues to the present day, changed the annual plant composition of the Buttes. Sutter and his contemporaries introduced the use of fire to clear valley and Butte areas to renew grazing and for agriculture.

The gold rush brought miners to work the gravels of the Feather River, followed by a steady stream of cattle drivers, homesteaders and settlers in the mid to late 1800s. Many of them stayed to cultivate the rich soils of the valley in Sutter County, and to graze cattle on the grasslands. The lower areas of the Buttes and its interior valleys became sparsely inhabited by ranchers, although the interior wild uplands remained unclaimed until the early 1900s. By 1930 the vast majority of Sutter County land was under cultivation, most of the ranches on the Buttes were abandoned, and the valleys of the Buttes were used only for grazing, as they are now, primarily by cattle.

Currently, most of Sutter County is zoned for agriculture. Generally, agricultural uses effectively limit the natural biodiversity and restrict the value of existing wildlife habitat in any area. However, some agriculture is compatible with some wildlife use, and in fact may become vital to certain wildlife species which have suffered a loss of natural habitat.

Today, although the Valley is still the major wintering area for waterfowl of the Pacific Flyway (Perry 1983), most of the wetlands have been drained for agriculture, the rivers are controlled by dams and levees, and flood waters are channeled into the Sutter Bypass and other artificial waterways. The Buttes remain relatively the same, except for changes caused by livestock grazing. The remaining wildlife habitat in the County has become more necessary to maintaining wildlife populations at existing levels, as the loss of natural areas throughout California have left a small proportion of the original habitat intact.

STUDY ORGANIZATION AND CONTENTS (OVERVIEW)

This section summarizes information on known biological resources throughout Sutter County, as well as the relative biological value of those resources. The results of a literature review are first summarized, followed by a description of the vegetation/habitat associations, including sensitive natural communities of Sutter County and the wildlife associated with the communities. Information on the communities follows the classification system set up by California Department of Fish and Game (Holland, 1986) referred to hereafter as Holland Element Codes. A discussion of special status plant and animal species recorded in or with potential habitat in the County is presented within Tables 9.8-4 and 9.8-5, with specific habitat requirements and location information. A description of the various state and federal classifications that are included under special status species is presented within Table 9.8-3. Finally, an analysis of the sensitivity of the resources is explained. A summary map, Figure 9.8-1, identifies the location and sensitivity of Sutter County biological resources. A larger scale and more detailed map set was also prepared and is available for viewing in the Community Services Department. Also available at the Community Services Department is a set of 1993 California Natural Diversity Data Base (CNDDDB) printouts for the County. This data base is maintained and updated by the California Department of Fish and Game Non-Game Natural Heritage Division to provide an inventory and locations of special status species in the state.

STUDY METHODOLOGY

Data Sources

Literature Review and Research

Background research was initiated by conducting a thorough review of the California Department of Fish and Game's Natural Diversity Data Base-RareFind computerized records (CNDDDB) and California Native Plant Society (CNPS) publications (CNPS, in press). A list was compiled of special status plant and animal species and sensitive natural communities that have been recorded within Sutter County.

To supplement and expand this information, a review of the following environmental documents was made for information concerning biological resources within the County:

- Sutter Bay Village Specific Plan and Golf Course Residential EIR (Michael Brandman Associates, 1992),
- Sutter County General Plan (Sutter County, 1983),
- South Sutter County General Plan Amendment EIR (The Planning Center, 1991),
- Proposed Ash Landfill EIR (ESA, 1992),
- Southwest Pease/Route 99 Residential Development Focused EIR (ESA, 1991)

Public and Private Expert Consultation

Consultation with the California Department of Fish and Game (CDFG) Region 2 biologists in Rancho Cordova (Brode, Whitmore, Zezulak, 1993), the CDFG Non-Game Natural Heritage Division in Sacramento (Bittman, 1993), the National Marine Fisheries Service (Lagomarsino, 1993), and the U.S. Fish and Wildlife Service (USFWS) Endangered Species office in Sacramento (White, 1993) was made to obtain additional information on special status species with potential to occur in Sutter County. Local experts were consulted to obtain additional information on local occurrences of sensitive natural communities and special status species, including: local chapters of the Audubon Society (Peacemaker, Manolis, 1993); California Native Plant Society (Skinner, 1993); Sutter National Wildlife Refuge (Mensik, 1993); USFWS National Biological Survey (Miller, 1993); experts on the biology of the Sutter Buttes (Ahart, Anderson, Bills, Heinrich, 1993); and Yuba Community College (Williams, 1993). Through this consultation process, other areas of biological concern were identified, such as wintering waterfowl concentration areas and important fisheries areas.

Aerial Photograph Interpretation

Recent (1992) black-and-white aerial photographs of the entire study area (scale of 1:24,000 [1" = 2,000']) were examined. Based on the scale and quality of the photographs, a classification system was developed for natural communities (based primarily on Holland, 1986) and agricultural and other land uses (based primarily on Mayer and Laudenslayer, 1988) known to occur within Sutter County. These community types include riparian corridors, stream channels (natural and

man-made), wetlands (including seasonal marshes and vernal pools), oak woodlands and chaparral, non-native grasslands, rice fields, orchards/vineyards, cropland, irrigated pasture lands, and developed areas. The aerial photographs of the County were photo-interpreted by qualified biologists to identify the geographical extent of each community type. Any areas not identifiable by the aerial photo examination were noted and targeted for later ground-truthing. During the aerial photo-interpretation task, an evaluation was made for the presence or the potential presence of special status plant and animal species known to occur in the region.

Ground-truthing Data (Field Work)

A targeted biological field reconnaissance (on January 13, 14, and 17, 1994) was conducted to assess the type, quality, distribution, and species' composition of existing plant communities by sampling representative areas. Specifically, the areas visited included the Sutter Buttes, Feather River, Sutter Bypass, borders of the Butte Sink, and areas not identifiable in the aerial photos. Existing plant communities were classified as closely as possible, following Holland (1986). Information obtained during the field reconnaissance was registered on the base photos as appropriate. Ground truthing in the field was brief and was conducted outside of the optimal survey period for the majority of special status species (e.g., performed outside of the flowering period of local special status plant species).

DATA SYNTHESIS, ANALYSIS, AND PRESENTATION

Mapping of Existing Data

Pertinent information gathered during ground truthing and expert consultation was mapped. Mapped data includes land use (on the General Land Use map on file with the County), known locations of sensitive natural communities, known records of special status species, and locations of other important biological resource locations.

Biological Resources Sensitivity Analysis and Mapping

Through combining all relevant special status species data and compiled plant community information, a simple three-tiered biological sensitivity classification system was developed for Sutter County lands: High Sensitivity; Moderate Sensitivity; and Low Sensitivity. The basis for ranking the sensitivity and relative importance of an area includes value of an existing resource (e.g., wildlife value of a natural community); legal federal or state status of the resource; location of the resource with respect to other sensitive resources; sensitivity or resiliency of the resource to withstand urban or agricultural development; potential to support special status species; and the potential for/feasibility of mitigation based on current knowledge and practice.

A County-wide Sensitive Biological Resources map was prepared using the three-tiered system, at an approximate scale of 1 inch = 1 mile. A reduced copy of this map is included at the end of this report, and the full-sized map is on file with the County. In mapping biological sensitivities, consideration was given to interactions between natural communities, including the values of community complexes/mosaics for common and special status wildlife species (e.g., foraging habitat adjacent to breeding areas). Explanatory text is included in later sections of this report.

VEGETATION COMMUNITIES AND ASSOCIATED WILDLIFE

Introduction

Natural vegetation communities, especially riparian corridors and wetlands, provide the primary habitat for most native California special status species. Each natural habitat type in Sutter County, such as live oak woodland or freshwater marsh, has an associated set of plant and animal species that normally occur there. However, in the past 100 years of Central Valley history, these habitats have been drastically reduced by urban development, water projects, and agriculture (CDFG, 1991). When a natural habitat becomes altered, dependent species which are unable to move elsewhere or to adapt to converted areas, such as agricultural lands, decline in number. When this comes to the attention of CDFG, these species are designated as "special status" species, connoting that the species seems to be declining and may eventually require listing as threatened or endangered.

Rapid human population growth and associated development in California is continually shrinking natural habitat into smaller and more isolated "islands," a process known as biological fragmentation. As these islands of natural habitat diminish, some special status species are reduced to occupying only the edges between agricultural lands to survive. While agricultural lands do provide some of the required habitat elements for these species, they cannot provide all of them. For example, grain crops and grazed grassland provide foraging habitat, but not nesting habitat, for the state-listed Swainson's hawk.

The natural communities described in this section are mapped on the General Land Use map that is on file with Sutter County. Urban lands and other developed lands, while included on the General Land Use map, are not classified as vegetation communities. Urban land generally contains a greater amount of construction and paved areas than vegetation. The vegetation present is primarily composed of non-native plant species, including turf grasses, shrubs, and trees commonly used for landscaping. Urban lands provide relatively low habitat value for wildlife and are not discussed in further detail below.

Native and Naturalized Plant Communities of Sutter County

Riparian Corridors

Riparian corridors include primarily remnant forest and scrub communities in Sutter County that occur along the edges of streams and the Sacramento and Feather Rivers. The riparian forest communities generally occur outside of the most active (i.e., most often subject to erosion) portions of stream channels, with scrub communities growing closest to the stream. The riparian forest communities are classified as Great Valley Cottonwood Riparian Forest (Holland Element Code #61410), with examples along the Feather River, and Great Valley Mixed Riparian Forest (Holland Element Code #61420), with examples along the Feather River, particularly near the confluence of the Feather and Bear Rivers (Holland, 1986; California Natural Diversity Data Base (CNDDB), 1993). The dominant tree species found in the cottonwood riparian forest community include Fremont's cottonwood and Goodding's black willow, while the mixed riparian forest community is dominated by a greater variety of species including box elder, sycamore, walnut, Fremont's

cottonwood, and several species of willow. Both types of riparian forest often support a lush understory of tree saplings, shrubs and vines such as Oregon ash, California button willow, California grape, blackberry, poison oak, and clematis. In more open portions of the forest, elderberry shrubs may occur.

The CNDDDB contains no records of Great Valley Willow Scrub (Holland Element Code #63410), although communities fitting Holland's description are known to grow along streams within the Sutter Buttes area (Anderson, 1983) and likely occur elsewhere along the Sacramento, Feather, and Bear Rivers. Riparian scrub communities are generally dominated by several different willow species, mulefat, small cottonwood seedlings, and sometimes, grasses in the understory (Holland, 1986; Anderson, 1983).

Riparian areas provide some of the highest wildlife habitat value of any community type in Sutter County. Throughout the Central Valley, riparian corridors contrast with the surrounding dry, open grassland and agricultural habitats, providing a sheltered area for wildlife with an abundant food and water supply. Conversion of nearly 99 percent of pre-European settlement riparian habitats in California has severely limited the extent of these habitats (Faber and Holland, 1988). As a result, many riparian-dependent wildlife species that are unable to adapt to alternative habitats are now declining.

Riparian areas support seasonal foliage, emergent vegetation, and invertebrates that provide forage for a large number of migratory birds using the Pacific Flyway. The Central Valley portion of the Pacific Flyway supports the largest single concentration of wintering waterfowl in North America, approximately 20 percent (Heitmeyer, 1989). Riparian woodlands provide nesting and roosting sites for waterfowl, such as wood ducks, and courtship and pairing areas for mallards and wood ducks. Nesting riparian birds use these areas because of the diverse forage opportunities on foliage, bark, seeds, and insects. Amphibians, reptiles, and mammals also use riparian areas for water, forage, cover (from predators and for thermal relief), and corridors for movement through otherwise open areas.

Because of the loss of most of the riparian habitat in California, some mammals and waterfowl species have adapted to agricultural habitats. Wintering waterfowl, including mallards and other ducks, geese, swans, and cranes, are now highly dependent on harvested grain fields, foraging on waste grains in croplands during mid-winter and on invertebrates in remnant riparian areas, seasonally flooded marshes, and rice fields. Other agricultural fields, such as wheat, hay, and set-aside lands provide nesting sites for resident waterfowl species in the summer. Waterfowl and other wildlife use of agricultural communities is discussed further in this report.

Many special status species that are known to occur or have potential to occur in Sutter County are dependent on riparian habitat. Neo-tropical birds (species that migrate to Central and South America in winter) that may breed in riparian areas of Sutter County include willow flycatcher, yellow-billed cuckoo, yellow warbler, yellow-breasted chat, purple martin, bank swallow and Swainson's hawk. Resident bird species that breed and/or forage in this community include Cooper's hawk, sharp-shinned hawk, tricolored blackbird, great blue heron, long-eared owl, great egret, black-shouldered kite, bald eagle, black-crowned night heron, osprey, double-crested cormorant, and

American white pelican. The ringtail is a special status mammal species known to occur in riparian areas of the County; the northwestern pond turtle and giant garter snake use the riparian habitats; and the valley elderberry longhorn beetle completes its entire life cycle in and on elderberry shrubs, which are frequently associated with open areas of riparian woodlands.

Natural Rivers or Stream Channels and Man-made Channels

Sutter County, located within the Sutter and Butte drainage basins, contains both natural and man-made waterways. Natural waterways include the Sacramento and Feather Rivers that define much of the County's boundary and smaller streams and sloughs that are most common in the northwest and southeast areas of the County. A Holland Element Code cannot be included for waterways themselves because aquatic communities are not included in Holland's classification system. The banks of some natural waterways support riparian communities, as described above, and others support marshy areas of emergent vegetation (Coastal and Valley Freshwater Marsh, Holland Element Code #52410). The dominant vegetation found in these emergent wetlands include cattail, tule bulrush, nutsedge, sedge, and arrowhead. Emergent wetlands provide valuable wildlife habitat distinct from the riparian forest. Mammals use emergent vegetation areas for cover and resting. The marshes also provide foraging and nesting habitat for birds.

Special status bird species that nest near freshwater marshes and stream channels in Sutter County include tricolored blackbird, northern harrier, snowy egret, and least bittern. Other special status birds forage in these areas, including short-eared owl, great blue heron, great egret, prairie falcon, California gull, greater sandhill crane, black-crowned night heron, and white-faced ibis. California tiger salamander, northwestern pond turtle, and giant garter snake are special status animals that may occur in stream channel and freshwater marsh habitats of Sutter County. Special status plants with potential to occur in freshwater marshes along stream channels include Ferris's milk-vetch, which has been recently rediscovered in the Butte Sink (CNPS, in press), rose mallow (California hibiscus), and trichocoronis. Palmate bird's beak is a special status plant that potentially occurs in alkaline emergent wetlands in Sutter County.

Man-made waterways in Sutter County convey irrigation water and provide drainage channels for the croplands. They form an extensive network throughout the County, much of which is relatively unvegetated, and provide low quality wildlife habitat. Some irrigation channels, however, support areas of vegetation similar to that found along the natural waterways, providing the same type of habitat for wildlife. These areas provide some of the most important remaining habitat in California for the state-listed giant garter snake. Recent surveys of the southern end of the County bordered by the Sacramento River, Natomas Cross Canal, and Natomas East Main Drainage Canal identified the presence of giant garter snake and its habitat within irrigation canals, ditches, and rice fields (Brode and Hansen, 1992). Previous surveys also identified giant garter snake habitat and potential habitat within the Butte Sink, East Butte Road north of Nuestro Road, Sutter Bypass, west of the Bypass north of Gilsizer Slough, and the area between the Sacramento River and the Sutter Bypass in the vicinity of Robbins (Beak Consultants, Inc., 1992; Hansen, 1988).

Off-channel Wetlands

This habitat category is similar to the emergent wetland described above, but these wetlands are relatively unconnected to a stream channel. Also known as seasonal wetlands, these areas include freshwater marsh, vernal swales, vernal seeps, and vernal pools. As with the stream channels, some of the seasonal wetlands in Sutter County are natural and others have been created by excavation for crop irrigation, livestock watering, or other purposes. Coastal and Valley Freshwater Marsh (Holland Element Code #52410) is recorded in the Butte Sink and Sutter Bypass (CNDDDB, 1993) and generally resembles the marsh community described above in the preceding section, with similar dominant vegetation and special status species habitat.

The natural seasonal wetland communities in Sutter County also include vernal pools, specifically the Northern Hardpan Vernal Pool (Holland Element Code #44110). Vernal pools occur in small depressions within non-native grasslands, described below, and fill with water during winter rains, gradually drying as the rainy season ends. The CNDDDB contains recorded occurrences of this community at the north end of the Sutter Bypass and along the northern side of the Sutter Buttes (CNDDDB, 1993). The vernal pool community provides potential habitat for an assemblage of endemic plant and animal species. Waterfowl and shorebirds forage in vernal pools when water is present, and amphibians such as the California tiger salamander, a special status species, breed in vernal pools. Other wildlife such as rodents and rabbits may use the pools as temporary water sources. Vernal pool habitats may support one or more special status invertebrates (e.g., fairy shrimp), and special status plant species including dwarf downingia, Bogg's Lake hedge-hyssop, toad rush, valley meadowfoam, and trichocoronis.

Chaparral and Oak Woodlands

In Sutter County, chaparral and oak woodland habitats occur primarily on the Sutter Buttes. Both communities occur widely and separately in the foothills on both sides of the Central Valley, although within the Buttes these two communities combine to create a complex patchwork. The two communities, however, are quite distinct from each other in their species composition. The Buttes support a chaparral type without chamise or buckeye, which are often common plants in other chaparral communities. The Buttes chaparral type, designated as Interior Live Oak Chaparral (Holland Element Code #37A00), is dominated by coffeeberry, northern redbud, toyon, scrub oak, poison oak, California bay, and manzanita (Anderson, 1983, 1993). Birds forage in the chaparral community on seeds, fruits, and insects and also find habitat for nesting and roosting. Small rodents and rabbits also inhabit this community, browsing on twigs and leaves and finding shade under the shrubs. The Marysville kangaroo rat is a special status animal that has been recorded in this community. The Sagebrush lizard has also been observed here, 40 miles from its closest range (Anderson, 1983). The chaparral also provides potential habitat for Colusa layia, a special status plant recorded on the Buttes (CDFG, 1993).

The oak woodland type that occurs on the Buttes is designated Interior Live Oak Woodland (Holland Element Code #71150). The species composition includes interior live oak, blue oak, occasional valley oak and oracle oak (a hybrid of interior live oak and black oak). Valley oak is a California special status species. These woodlands provide important habitat for many birds, for both nesting

and acorn and insect foraging. Oaks are also used by many mammals. Deer browse and rest in the shade and other smaller mammals feed on acorns, leaves, and invertebrates. Special status wildlife species known to occur in oak woodlands in Sutter County include San Joaquin pocket mouse, nesting Swainson's hawk, golden eagle, and northern loggerhead shrike.

Non-native (Annual) Grassland

The Non-native Grassland community type (Holland Element Code #42200) is very widespread in the valleys and foothills of California, and is composed largely of low-growing annual grasses and forbs. Because the grass species did not evolve here, the community type is termed by botanists "non-native." The grasses were introduced to California for livestock forage and spread quickly. This upland community type is perpetuated by livestock grazing. The non-native grassland communities in Sutter County extend over portions of the Sutter Buttes, between areas of oak woodland and chaparral, and exist in many smaller patches in other parts of the County among agricultural fields and within undeveloped portions of urban areas. Vernal pools, described under Off-channel Wetlands, occur within this community in small natural depressions with an underlying hardpan layer. The grassland community is dominated by grass species such as wild oats, soft chess, ripgut brome, foxtail barley, and Italian ryegrass, and annual forbs ("wildflowers"), including California poppy, lupine, tidy tips, owls clover, storksbill, and many others.

Grasslands produce large numbers of seeds, an important and reliable food source for numerous seed-eating birds. Raptors cruise the grasslands for preying on these birds and small mammals. Mammals relying on grassland communities include both species that forage on seeds and leaves and carnivores that prey on them. Some mammals construct burrows or dens that, when abandoned, are used by birds such as the burrowing owl or certain reptiles and amphibians. Only a few species of reptiles and amphibians are found in grasslands, because the low structural diversity, that is the "sameness" of the area, provides few sources of refuge other than mammal burrows.

Special status bird species that forage or hunt in grassland habitats include golden eagle, tricolored blackbird, short-eared owl, ferruginous hawk, Swainson's hawk, northern harrier, black-shouldered kite, merlin, prairie falcon, northern loggerhead shrike, greater sandhill crane, and long-billed curlew. Burrowing owl is a special status bird that nests as well as hunts in grasslands. One special status reptile, the coast horned lizard, has potential to occur in Sutter County grasslands. Special status plant species that may occur in this community include veiny monardella, Hartweg's golden sunburst, Ferris's milk-vetch, toad rush, Colusa layia, and trichocoronis.

Agricultural Plant Communities

Although natural communities provide the highest values to waterfowl and wildlife, agricultural communities have become important to numerous wildlife species in the Central Valley. Flooded rice fields, for example, are an important substitute for the native wetland habitats of the state and federally threatened giant garter snake. Harvested rice and corn fields provide important foraging areas to migratory waterfowl in the Central Valley. Row crops with value to wildlife and waterfowl include irrigated pasture and grains like wheat, barley, oats, and alfalfa. Remaining crop types, such as other row crops, orchards and vineyards, generally provide low wildlife habitat values.

Agricultural lands are generally not as useful to mammals, reptiles, and amphibians as they are to birds. Deer, for example, require both a reliable food supply and cover from the elements and from predators within their home range, as well as habitat for rutting and fawning. These requirements limit the availability of suitable habitat. Agricultural fields generally do not provide the different structural components needed for large herbivores, as they usually consist of monocrops of a uniform height. Neither is the necessary food diversity generally available in natural communities, such as bark, diverse foliage, berries, etc. These mammals do make use of agricultural land when traveling from one natural community to another or when under heavy environmental stress. Small mammals, such as rabbits and rodents, forage on the leaves or roots of crops, and in turn may attract small predators such as hawks or feral cats. Other mammalian species known to use agricultural areas include coyote, raccoon, skunks, opossum, and river otters.

Special status bird species that forage in agricultural lands include tricolored blackbird, Swainson's hawk, black-shouldered kite, merlin, greater sandhill crane, California gull, long-billed curlew, and Aleutian Canada goose. California horned lark may also nest in pasture lands.

Rice

Rice fields have partially replaced the role wetland communities once played in the natural ecosystems of the Central Valley. In fact, harvested rice fields and corn fields are the primary agricultural lands used by wintering waterfowl in the Central Valley (Heitmeyer, 1989). Depending on the extent of surrounding natural vegetation and vegetation diversity, irrigated rice lands are capable of providing high wildlife value for several resident bird species. Rice fields have also become an important substitute for the natural habitat of the state and federally threatened giant garter snake. However, irrigated rice lands are of limited value for most terrestrial wildlife species, such as small mammals, because these areas are inundated during much of the spring and summer activity periods of these species.

Vegetated drainage canals, natural drainages, and rice field/levee boundaries, especially those that support dense stands of cattails, tules, blackberries, willows, and cottonwoods, provide substantial value to local wildlife by increasing habitat diversity, plant species composition, and good cover. This habitat was previously described in Natural Rivers or Stream Channels and Man-made Channels.

From season to season, rice fields support a changing variety of wildlife species. During spring planting the fields are flooded, attracting great blue herons, great and snowy egrets, white-faced ibis, raccoons, and sometimes river otters. These species forage on aquatic insects, crustaceans, clams, and snails that inhabit flooded rice lands. Other species that use rice fields throughout the summer months include teal, mourning dove, swallows, black tern, black-necked stilt, American bittern, killdeer, red-winged blackbird, and opossum.

Rice fields typically remain flooded until the fall harvest (around early September). During harvest, snow geese, Ross's geese, Canada geese, greater white-fronted geese (tule geese), and tundra swans customarily begin arriving for winter in the Sacramento Valley (Heitmeyer, et al. 1989). These species and other waterfowl forage on rice, aquatic insects, and succulent aquatic plant species, such

as watercress, which commonly grow in rice fields. Diving ducks, such as redhead, scaup, ruddy duck, and bufflehead, do not feed on crops as frequently as dabbling ducks, such as mallards, pintails, and widgeon, as they are awkward on land and are more vulnerable to predation. Diving ducks will, however, use deeply flooded rice fields. During the winter, after the rice fields have been harvested and more waste grain is available, the abundance of small mammals in rice lands increases, resulting in an increased number of foraging hawks.

Orchards

Individual orchards are typically dominated by a single horticultural species planted in a uniform pattern of rows. The tree crowns do not usually touch, and the understory, composed of grasses and low-growing herbs, is open and may be maintained by mowing or chemical control. Major orchard crops grown in Sutter County include English walnuts, almonds, prunes, and peaches (Sutter County Dept. of Agriculture, 1992). Vineyards are included within this category. Vineyard crops are structured in rows, but usually without spaces within a row. Grasses and herbs are generally allowed to grow between rows to control erosion. Vineyard crops grown in Sutter County include kiwis and various berries.

Orchards and vineyards provide little habitat for wildlife, although they may provide some perching and nesting areas for birds, and evergreen orchards provide some cover for wildlife. Certain wildlife species occasionally become agricultural pests, feeding on nuts and fruits grown in orchards and vineyards, and are therefore often discouraged by various means. Some orchard types, such as almond and olive, provide food for deer, raccoons, rabbits, squirrels, and other wildlife. Almond or walnut orchards adjacent to riparian forests along the Sacramento River are occasionally used as nesting habitat by the state endangered yellow-billed cuckoo (Layman, 1980).

Row or Field Crops

Row or field crops include vegetables, fruits, and grains that are planted in uniform rows. Major crops grown in Sutter County include tomatoes, melons, beans, sugar beets, and various grains (Sutter County Dept. of Agriculture, 1992). Vegetation in this habitat can vary from a few inches to ten feet in height, depending on the specific crop. Densely planted crops form almost complete cover.

Crops such as wheat, barley, and oats are typically planted in the fall and provide some cover for wildlife during the late winter, spring, and early summer. Grain crops are also important food sources for some seed-eating birds, such as pheasant, quail, and dove, and provide grazing to geese and widgeons.

Row and field crops provide good nesting habitat for pheasants, dove, quail, certain waterfowl, and other ground-nesting wildlife species. Harvesting practices, normally begun in June or July, allow these species to complete their cycle of breeding prior to disturbance. These crop types provide substantially higher value to nesting species and their young when they are located adjacent to water, such as drainage ditches or sumps, where cover and foraging habitat is supplied. However, direct destruction of nests and young and indirect destruction through decreased cover and exposure to

predators occurs when harvesting is performed in May, the peak nesting month, to increase crop yield (California Waterfowl Association, 1991). Oats, for example, if swathed green for bailing, are harvested in early May during the peak nesting month.

Crops also provide an indirect but limited food source in the form of insects, and cover for birds and mammals but typically do not provide adequate foraging grounds for predators such as raptors. There are some exceptions to this. Corn, for example, provides cover for deer and coyote in the summer, and forage for waterfowl in the winter after harvesting. In the Central Valley, harvested corn fields are one of the primary agricultural lands used by wintering waterfowl (Heitmeyer, 1989), however very little corn is grown in Sutter County.

Irrigated Pasture

Irrigated pasture includes areas of planted perennial grasses and legumes (clover) that compose a uniform and generally complete cover, although the height and density of vegetation varies depending on cultural and grazing practices. When the grasses and clover are mature, livestock is brought in to graze it. Irrigated pasture may be grown in cropland areas as part of a crop rotation program.

Irrigated pasture provides some habitat for grassland-adapted species. Birds using these areas consume seeds, foliage, and insects and may nest on the ground. Small mammals, such as harvest mice and house mice, are attracted to these areas as well. Resident birds of prey, such as red-tailed hawk and black-shouldered kite, a special status species, use these areas for hunting small mammals. Merlin and Swainson's hawk, also special status species, use these types of fields for hunting during the winter migration along the Pacific Flyway. The Aleutian Canada goose, an endangered subspecies of the Canada goose, winters on low, open pasture lands in Sutter County.

IMPORTANT BIOLOGICAL AREAS

Rivers and Bypasses

Sacramento River

The Sacramento River extends for approximately 70 miles along the western border of Sutter County. The river provides aquatic habitat, and the banks support areas of intermittent riparian vegetation between agricultural lands. Resident fish species as well as the winter-run chinook salmon, a federal and state endangered species, occur in the river. Other runs of chinook salmon also use the Sacramento River for spawning, and all are declining in number (Lagomarsino, 1993). Other anadromous fish species that spawn in the Sacramento River include steelhead trout, striped bass, sturgeon, and American shad. Riparian areas along the riverbanks are known to support several special status species, such as migrating willow flycatchers, nesting Swainson's hawk, and valley elderberry longhorn beetle. Bank swallows have constructed colonies of nests in the riverbanks. (CDFG, 1993; Sanders, 1993)

Feather River/Bear River

The Feather River extends approximately 45 miles through Sutter County, forming part of the east Sutter County boundary. The Bear River roughly parallels about 11 miles of the eastern County boundary, crossing the boundary at several points. The confluence of the Feather and Bear Rivers is several miles north of the town of Nicolaus. The Feather River reaches its confluence with the Sacramento River at the southern County boundary near Verona. The section of river between Nicolaus and Verona is bordered by a riparian strip that provides important wildlife habitat, including habitat for special status species such as western yellow-billed cuckoo, Swainson's hawk, and valley elderberry longhorn beetle. This riparian strip has been designated as an Area of Critical Concern by the Sacramento Audubon Society (1989).

Another Audubon Area of Critical Concern includes both sides of the Feather River from Nicolaus north to the Star Bend CDFG Wildlife Area. This 3,700-acre area contains the largest contiguous example of mixed riparian forest remaining in the Central Valley. This area includes Bobelaine Audubon Sanctuary, lands owned and managed by CDFG, and private lands and supports special status species such as the western yellow-billed cuckoo and ringtail as well as a combined great egret, green-backed heron, and great blue heron rookery, many mammal species, and anadromous fish such as salmon (Sacramento Audubon Society, 1989).

Five CDFG management areas make up the CDFG Feather River Management Unit, which includes Abbott Lake (437.8 acres), O'Connor Lake (363.78 acres), Nelson Slough (751.45 acres), Lake of the Woods (662 acres), and Star Bend (50 acres). The former three units, encompassing 1,553 acres, are in Sutter County and the latter two are on the east bank of the Feather River in Yuba County. All five areas are managed by CDFG for fishing, hunting, and other recreational use, and hold water seasonally, except for Abbott Lake which holds water on a year-round basis. Plant communities within these subareas include seasonal wetlands, riparian forest, and, in the Nelson Slough Management Unit, rice fields.

Mammalian wildlife along the Feather River includes black-tailed deer that use riparian woodlands for cover and channel bottoms in the Feather River and Sutter Bypass during periods of low water. Common furbearer species, both terrestrial and aquatic, are also found in this area, including California spotted skunk, striped skunk, raccoon, long-tailed weasel, badger, Virginia opossum, ringtail, beaver, river otter, muskrat, mink, gray fox, and black-tailed jackrabbit. Bobcat and coyote potentially occur in the area, and various small rodents are also present (CDFG, 1991).

A variety of bird species inhabit the riparian areas along the Feather River. A combined great egret and great blue heron rookery exists near O'Connor Lakes, and CDFG has designed management practices to enhance habitat for special status bird species such as Swainson's hawk, yellow-billed cuckoo, bank swallow, and bald eagle (CDFG, 1991). CDFG has recorded the presence of bank swallow, yellow-billed cuckoo, and valley elderberry longhorn beetle along the River (CDFG, 1993).

Aquatic resources of the Feather River include populations of largemouth bass, bluegill, redear sunfish, green sunfish, black crappie, and golden shiner. Channel catfish are found within Abbott Lake (CDFG, 1991).

The Bobelaine Audubon Sanctuary is a 430-acre reserve located within an extensive riparian area along the Feather River near its confluence with the Bear River. The reserve has been primarily used for nature walks and education. A fire in September, 1992 destroyed much of the riparian forest in the Reserve, however, and the area is currently being restored. Sightings of yellow-billed cuckoo and Swainson's hawk have been made within the riparian areas, and bank swallow colonies occur in the river bank (CDFG, 1993; Manolis, 1993).

Sutter Bypass/Tisdale Bypass

The Sutter Bypass, part of the Sacramento Flood Control System, is an artificial flood control corridor approximately 3/4 mile wide, bordered by two parallel channels. The Bypass extends from the Sacramento River in the northwest portion of the County approximately 35 miles south to the Feather River. Within the Bypass corridor are areas of agricultural lands, riparian habitat, and seasonal wetlands. The riparian area along the western levee of the Bypass is an Audubon Area of Critical Concern due to the plentiful wildlife it supports (Sacramento Audubon Society, 1989). The Sutter National Wildlife Refuge, further discussed below, is an extensive area of freshwater marsh habitat located within the Bypass. At the north end of the Bypass is the 178-acre Butte Slough Wildlife Area, which is managed by CDFG. Several sloughs that connect the east and west channels across the Bypass provide smaller areas of stream channel and riparian habitat. Nesting yellow-billed cuckoo have been sighted in riparian areas of the Sutter Bypass in 1992 and 1993, and yellow-breasted chat may also be present (Zezulak, 1993). The Bypass also contains nesting Swainson's hawk, bank swallow colonies, tricolored blackbird colonies, and populations of the rose mallow (*California hibiscus*). Salmon and warm water fish are also found within the Bypass area (CDFG, 1993).

Another flood control corridor, the Tisdale Bypass, extends for approximately four miles due west from the Sutter Bypass. Its purpose is to channel flood water eastward from the Sacramento River to the Sutter Bypass. The Tisdale Bypass primarily contains upland areas of non-native grassland interspersed with freshwater marsh and riparian areas. Swainson's hawk, a special status bird species, has been recorded here (CDFG, 1993).

Wildlife Refuges

Sacramento National Wildlife Refuges

The Sacramento National Wildlife Refuges (NWRs) include five separate refuges managed by the USFWS (Sacramento NWR, Delevan NWR, Colusa NWR, Butte Sink NWR, and Sutter NWR). The Sutter and Butte Sink NWRs are located in Sutter County. Sutter NWR is a 2,650-acre area within the Sutter Bypass managed by USFWS to attract migratory waterfowl and is used by the public for wildlife observation and hunting, in season. Habitat within the NWR includes freshwater marsh and upland areas of non-native grassland. The Butte Sink NWR includes more than 730 acres of wetlands in the Butte Sink, an important wintering area for waterfowl, and is not open to the public.

Sutter NWR supports a number of raptor species, including northern harrier, black-shouldered kite, and Cooper's hawk, and a small population of black-tailed deer (Sacramento Valley National Wildlife Refuges, 1992). The CDFG has recorded a population of rose mallow (California hibiscus) within the Sutter NWR and wintering Aleutian Canada goose in the Butte Sink NWR (CDFG, 1993).

Waterfowl are plentiful in all of the Sacramento NWRs during winter and early spring. Migration occurs along the Pacific Flyway, a bird "highway" that connects wetlands in the western states. The Central Valley is the most heavily used portion of the Pacific Flyway, supporting about 60 percent of the migrating waterfowl (USFWS, 1993).

Each year, CDFG and USFWS collect and compile data to develop mid-winter indices for wintering waterfowl use in the Sacramento Valley. These indices are counts of waterfowl taken during a short period in January of each year. Although the indices do not represent the maximum number of waterfowl present during a given year, because the Sacramento Valley receives greater use later in the season, they are useful for determining the relative use of different portions of the Valley and for monitoring trends. Two areas of Sutter County are monitored, Sutter NWR and Butte Sink. An examination of the data for these two areas indicates that, for their relatively small size, they host a substantial proportion of the waterfowl wintering in Sacramento Valley. Table 9.8-1 below compiles five-year averages of the mid-winter index data from the Sutter NWR, Butte Sink, and, for comparison, the entire Sacramento Valley (Yparraguirre, 1993). Also, the numbers show a steady and rapid decline throughout the Valley in numbers of birds since 1979.

TABLE 9.8-1
NUMBERS OF WATERFOWL PRESENT IN MID-WINTER

	Avg. 1979-1983	Avg. 1984-1988	Avg. 1989-1993
Sutter NWR	312,635	229,095	151,340
Butte Sink	463,373	294,423	282,618
Entire Sacramento Valley	3,107,812	2,425,431	1,903,518

Source: CDFG, 1979-1993

Gray Lodge Wildlife Area

Although only a small part of the 8,400-acre Gray Lodge Wildlife Area extends from Butte County into Sutter County, this region as a whole is important for wintering waterfowl, which may move between the nearby Butte Sink and Gray Lodge. Gray Lodge is managed by CDFG primarily for waterfowl, although upland areas also exist, and is open to the public for hunting, fishing, and sightseeing by car and on foot. A large number of special status bird species have been observed at Gray Lodge including American white pelican, double-crested cormorant, least bittern, osprey, northern harrier, sharp-shinned hawk, Cooper's hawk, golden eagle, merlin, prairie falcon, California gull, burrowing owl, long-eared owl, short-eared owl, willow flycatcher, purple martin, bank swallow, yellow warbler, and yellow-breasted chat. Several additional special status bird species have been observed, but were considered to be of accidental occurrence and are not regular visitors to the area. (CDFG, undated pamphlet)

Privately Owned Waterfowl Concentration Areas

Rice fields and duck clubs in Sutter County are important habitats outside of the NWRs for migrating waterfowl. Although mid-winter counts discussed above are not conducted on private agricultural lands, other data have been collected throughout the County by Michael Miller of the U.S. National Biological Survey in a study of radio-tagged pintail ducks. The portion of these data for southern Sutter County provides an index for waterfowl use on private agricultural lands, primarily rice and irrigated pasture. As in the rest of the County, these areas are most heavily used later in winter (January-March). Table 9.8-2 below shows the percentage of radio-tagged pintail ducks in Sutter County that congregated in the southern part of the County (Miller, 1993). Although these data do not provide total counts of waterfowl using the southern County, it is apparent that this area is a significant part of the Sutter County waterfowl wintering grounds.

Butte Sink

Part of the 80-mile long Butte Basin, the Butte Sink is one of the largest riparian wetland remaining in California (CVHJV, undated). Butte Creek forms the northwest County boundary and borders the Sink where it extends into Sutter County. The Sutter Buttes are adjacent to the southeast portion of the Sink. Outside of the Butte Sink NWR, most of the Sink is privately owned and managed for hunting clubs. The Sacramento National Wildlife Refuge has actively sought conservation easements to preserve wetlands around Butte Sink. As of April, 1995, a total of 6,731 acres of wetlands were protected by such easements. Butte Sink is a key wintering area for waterfowl that use the Pacific Flyway, which is a primary migration route for waterfowl in North America (Dan Yparraguirre, 1993). The CDFG records yellow-billed cuckoo nesting within Butte Sink, Aleutian Canada goose wintering in flooded fields at the south end of the Sink, as well as populations of rose mallow (California hibiscus) (CDFG, 1993). The Sink also contains areas of alkaline wetlands that provide potential habitat for special status plants (Ahart, 1993).

TABLE 9.8-2

**PERCENTAGE OF RADIO-TAGGED PINTAIL DUCKS LOCATED
IN SOUTHERN SUTTER COUNTY**

	January
	February
	March
1987-1990	23%
	52%
	33%
1991-1993	59%
	78%
	43%

Source: Miller, 1993

Sutter Buttes

The Sutter Buttes is a large, privately owned area that is topographically and biologically unique in the Central Valley. Located in the northern central part of Sutter County, the Buttes rise abruptly from the valley floor to elevations over 2,000 feet. Measuring the Buttes horizontally, i.e., on a flat map, the area includes roughly 40,000 acres; including the topography. This geographical diversity supports a variety of natural vegetation communities including oak woodland, chaparral, non-native grassland, and vernal pools and other seasonal wetlands. When considered individually, most of these communities are not particularly rare (with the exception of the vernal pools). It is their combination and their location in the middle of the Central Valley that makes the area special. The Buttes are, in effect, an ecological "island" that should be considered as a biologically sensitive unit.

Due to the diverse habitats within the Buttes, many plant and animal species occur there, including at least one anomalous species, the sagebrush lizard, not usually found in the Sacramento Valley. The Buttes support an endemic species of kangaroo rat, the Marysville kangaroo rat, and two special status plant species, San Francisco campion and rose mallow (California hibiscus), all of which are recorded by CDFG (1993). A comprehensive species list of animals, plants, and fungi is provided in The Sutter Buttes: A Naturalist's View (Anderson, 1983).

Around 1980, two pair of feral pigs were introduced to Sutter Buttes. In spite of constant efforts at culling the pigs out, they have multiplied to number around 1,000. These animals damage natural plant communities and can permanently alter valuable wildlife habitat.

Portions of the Buttes continue to be used as agricultural lands for grazing cattle and, to a lesser extent, sheep. Public access to the Buttes is provided primarily in the form of interpretive hikes.

SPECIAL STATUS SPECIES

The designation "special status" includes all species that are state or federally "listed" as rare, threatened, or endangered; species petitioned, proposed, or designated as candidates for such listing; and species of special concern that are declining and may become listed. Special status species are of concern to the State of California because of the decline in their populations triggered by loss or change in habitat, over-exploitation, predation, competition, or disease (CDFG, 1980). In the Sacramento Valley, many species have been listed due to the loss of habitat to agricultural and urban expansion. Some wildlife species, such as the Aleutian Canada goose and Swainson's hawk, are able to use agricultural fields for foraging. However, the majority of other special status species, such as the state endangered willow flycatcher, are unable to use agricultural lands, and a net decrease in habitat has occurred in recent history.

Explanations of the various special status designations are detailed in Table 9.8-3. A few additional designations exist that are not explained because they are not used for biological resources in Sutter County.

Special status plant and wildlife species known to occur in Sutter County are listed in Tables 9.8-4 and 9.8-5. The species lists are derived from the California Department of Fish and Game's Natural Diversity Data Base (CNDDDB), existing environmental documents, and local sources as described in the section on study methodology. These tables include species that have historical sighting records in the County or are likely to be present due to the availability of suitable habitat. The Sensitive Biological Resources map at the end of this report (Figure 9.8-1) shows all occurrences of Sutter County special status species in the CNDDDB records and specific occurrences obtained through the literature review, personal contacts, and field work described in previous sections. Mapped historical occurrences that are now presumed to be extirpated are followed by "(h)" on the overlay. All other mapped occurrences are presumed by the CNDDDB to still exist.

See the bibliography at the end of this chapter for more information on legal protection of special status species. For more comprehensive lists of plant and animal species in Sutter County that have no special status, please refer to California Native Plant Society (in press), Zeiner et al. (1988 and 1990), Holland (1986), Anderson (1983), and Sutter County (1983).

TABLE 9.8-3: SPECIAL STATUS SPECIES PROTECTION CLASSIFICATION

FEDERAL STATUS

The Endangered Species Act of 1973 empowered the U.S. Fish and Wildlife Service (USFWS) to protect animal and plant species that were under certain legally defined degrees of endangerment. "Lists" of the species are published in the Federal Register.

E =	Endangered	Species in danger of extinction throughout all or significant portion of its range.
PtE =	Petitioned Endangered	Species petitioned by a source outside of USFWS to be proposed for endangered status.
T =	Threatened	Species likely to become endangered within foreseeable future throughout all or significant portion of its range.
PT =	Proposed Threatened	Species for which the USFWS has published a proposed regulation for threatened status in the Federal Register, but not a final rule.
C1 =	Category 1 Candidate	Information now available indicates that listing may be appropriate with supporting data currently on file.
C2 =	Category 2 Candidate	Information now available indicates that listing may be appropriate but supporting data is not currently on file.
2R =	Recommended Category 2	Species recommended by a source outside of USFWS to be considered for Category 2 Candidate status--a less formal procedure than a petition.
C3B =	Category 3b	Non-candidate previously considered candidate but now invalid taxonomically.
C3C =	Category 3c	Non-candidate previously considered candidate but now too widespread or not threatened.

TABLE 9.8-3: SPECIAL STATUS SPECIES PROTECTION CLASSIFICATION (CONTINUED)

CALIFORNIA STATE STATUS

California Department of Fish and Game (CDFG):

The California Endangered Species Act of 1984 united the various sections of CDFG Code dealing with endangered species and aligned them with the Federal law.

E = Endangered Species whose continued existence in California is jeopardized.

T = Threatened Species, although not presently threatened with extinction in California, which is likely to become endangered in the foreseeable future.

The Non-game Natural Heritage Division of CDFG maintains the California Natural Diversity Data Base (CNDDB), which stores information on the locations and status of special status plant and animal species. The plant list is maintained in close cooperation with the California Native Plant Society (CNPS). The CNDDB also keeps a list of "Special Animals," which is a broad term used to refer to all of the animal taxa of concern to the CNDDB regardless of their legal or protection status. This list includes all of the federally listed, proposed for listing, and candidate species and all of the state listed species, plus the following:

CSC = Species of Special Concern Animal species with California breeding populations that may face extinction in the near future.

CFP = Fully Protected Bird species protected under California Fish and Game Code, Sections 3503, 3511, and 3513.

SA = Special Animal Species is of concern to the California Natural Diversity Data Base.

CALIFORNIA NATIVE PLANT SOCIETY

The California Native Plant Society (CNPS) maintains additional lists of plant taxa of concern, some of which are defined below.

1B = List 1B Plants are rare and endangered in California and elsewhere.

2 = List 2 Plants are endangered in California, but more common elsewhere.

4 = List 4 Plants of limited distribution (a "watch" list).

SOURCE: Environmental Science Associates, Inc., 1994

TABLE 9.8-4: SUTTER COUNTY SPECIAL STATUS PLANT SPECIES

Species	Status (Federal/ State/CNPS)*	Flowering Period	Habitat Requirements	Known Location(s) or Examples of Potential Habitat
Ferris' milk-vetch <i>Astragalus tener</i> var <i>ferrisiae</i>	C2/none/1B	April-May	Wet meadows and sub-alkaline flats in grasslands	Butte Sink
Palmate bird's beak <i>Cordylanthus palmatus</i>	E/E/1B	June	Alkaline wetlands, typically underlain by soils of the Pescadero and Solano soil series	Potential habitat - Butte Sink
Dwarf downingia <i>Downingia humilis</i> (<i>H. pusilla</i>)	C3C/none/1B	March-May	Vernal pools in Central Valley and adjacent hills to Sonoma Co.	Potential habitat - Sutter Buttes, Sutter Bypass
Bogg's Lake hedge-hyssop <i>Gratiola heterosepala</i>	C2/E/1B	April-June	Vernal pools and lake margins, Lassen Co. to Fresno Co.	Potential habitat - Sutter Buttes, Sutter Bypass
Rose mallow (California hibiscus) <i>Hibiscus californicus</i> (<i>H. lasiocarpus</i>)	C2/none/2	August-September	Edges of freshwater marsh habitats, also found along perennial drainages, ditches, and disturbed areas; below 130 feet	Butte Sink, Sutter Buttes, Sutter Bypass, Sac. River
Toad rush <i>Juncus bufonius</i> var. <i>congdonii</i> (<i>J. b.</i> var. <i>congestus</i>)	none/none/4	April-September	Vernal pools, adjacent grasslands	Potential habitat - Sutter Buttes, Sutter Bypass
Ahart's dwarf rush <i>Juncus leiospermus</i> var. <i>ahartii</i>	C1/none/1B	April	Vernal pools in Butte and Calaveras Counties	Potential habitat - Sutter Buttes, Sutter Bypass
Colusa layia <i>Layia septentrionalis</i>	none/none/1B	April-May	Chaparral, woodland, or grassland on sandy, serpentinitic soils	Sutter Buttes
Valley meadowfoam <i>Limnanthes floccosa</i> ssp. <i>californica</i>	C1/E/1B	March-May	Vernal pools below 1000 feet	South of Sutter Buttes, north of State Route 20
Veiny monardella** <i>Monardella douglasii</i> var. <i>venosa</i>	C2/none/1B	May	Grasslands	Feather River near Marysville

TABLE 9.8-4: SUTTER COUNTY SPECIAL STATUS PLANT SPECIES (CONTINUED)

Species	Status (Federal/ State/CNPS)*	Flowering Period	Habitat Requirements	Known Location(s) or Examples of Potential Habitat
Hartweg's golden sunburst** <i>Pseudobahia bahiifolia</i>	PE/E/1B	March-May	Valley grassland and foothill woodland on clay soil or grassy slopes; 100-1,000 feet	Historical presence-Feather River, Potential habitat - Sutter Buttes
Valley oak <i>Quercus lobata</i>	none/none/4	March-April	Riparian forest, cismontane woodland, and as individual trees throughout the Central Valley	Sutter Buttes, Sac. and Feather rivers
San Francisco campion <i>Silene verecunda</i> ssp. <i>verecunda</i>	C2/none/1B	March-June	Coastal scrub, grasslands on rock outcrops	South Butte
Trichocoronis** <i>Trichocoronis wrightii</i> (T. w. var. w.)	none/none/2	May-September	Freshwater marshes, riparian forests, meadows, and vernal pools in alkaline soils	Historical presence in Sutter County; Potential habitat - Sutter Buttes, Sutter Bypass, Butte Sink

Sources: CNDDB, Sutter Bay DEIR, Sutter Ash Landfill EIR, South Sutter Co. General Plan Amendment EIR, CNPS Inventory (5th ed., in press)

*See Table 10.8-3 for Status Definitions

**Presumed, by CNPS, to be extirpated in Sutter County

TABLE 9.8-5: SUTTER COUNTY SPECIAL STATUS WILDLIFE SPECIES

Species	Status (Federal/State)*	Sensitive Period**	Habitat Requirements	Known Location(s) or Examples of Potential Habitat
INVERTEBRATES				
Conservancy fairy shrimp <i>Branchinecta conservatio</i>	PE/none	Present yearlong (reproduction Dec.-Feb.)	Vernal pools/Central Valley and lower Sierra foothills	Potential habitat - Sutter Buttes, Sutter Bypass
Vernal pool fairy shrimp <i>Branchinecta lynchi</i>	PE/none	Present yearlong (reproduction Dec.-Feb.)	Vernal pools/ Central Valley and lower Sierra foothills	Potential habitat - Sutter Buttes, Sutter Bypass
Valley elderberry longhorn beetle <i>Desmocerus californicus dimorphus</i>	T/none	Present yearlong (emerges May-July)	Elderberry shrubs (host plant) throughout the Central Valley/foot-hills; typically prefers stressed plants with stems 1-12 inches in diameter	Sacramento River, Feather River
Vernal pool tadpole shrimp <i>Lepidurus packardii</i>	PE/none	Present yearlong (reproduction Jan.-March)	Vernal pools/Central Valley and lower Sierra foothills	Potential habitat - Sutter Buttes, Sutter Bypass
California linderiella <i>Linderiella occidentalis</i>	PE/none	Present yearlong (reproduction Jan.-Feb.)	Vernal pools/ Central Valley and lower Sierra foothills	Potential habitat - Sutter Buttes, Sutter Bypass
FISH				
Winter-run chinook salmon <i>Oncorhynchus tshawytscha</i>	T/E	August - March	Anadromous fish, migrate to freshwater spawning grounds	Sacramento River
Green sturgeon <i>Acipenser medirostris</i>	2R/none	Unknown	Anadromous fish, migrate to freshwater spawning grounds	Sacramento River
REPTILES/AMPHIBIANS				
California tiger salamander <i>Ambystoma tigrinum californiense</i>	PE/CSC	Present yearlong (aestivates) (surface active Dec.-Feb.)	Breeds/forages in vernal pools and slow-moving streams without predatory fish in grasslands and valley-foothill hardwoods, aestivates in burrows/ 0-4,500 ft.; Central Valley and Sierra foothills	Sutter NWR
Northwestern pond turtle <i>Clemmys marmorata marmorata</i>	C2/CSC	Present yearlong (breeds April - September)	Ponds and quiet waterways in grassland, oak woodland, and coniferous forest, permanent water/ 0-6,000 feet throughout CA (northern)	Butte Sink, Sutter Bypass
Coast horned lizard <i>Phrynosoma coronatum frontale</i>	none/CSC	Present yearlong (egg laying May-June)	Grasslands below 2000 feet containing sandy washes, open areas, insect prey base (ants)	Potential habitat - Sutter Buttes

TABLE 9.8-5: SUTTER COUNTY SPECIAL STATUS WILDLIFE SPECIES (CONTINUED)

Species	Status (Federal/State)*	Sensitive Period**	Habitat Requirements	Known Location(s) or Examples of Potential Habitat
REPTILES/AMPHIBIANS (cont.)				
California red-legged frog <i>Rana aurora draytonii</i>	PrE/CSC	Present yearlong (breeds January-July)	Quiet pools of streams, marshes, and ponds; deposits eggs on emergent vegetation in permanent pools	Potential habitat - Sutter Buttes
Foothill yellow-legged frog <i>Rana boylei</i>	C2/CSC	Present yearlong (egg laying March-May)	Rocky streams in a variety of forest and shrub communities and wet meadows; deposits eggs on gravel/rocks near stream banks in moving water	Potential habitat - Sutter Buttes
Western spadefoot toad <i>Scaphiopus hammondi hammondi</i>	2R/CSC	Present yearlong (surface active Jan.-March)	Primarily in grasslands with vernal pools and woodlands, may persist for a few years in converted orchard/vineyard habitat; deposits eggs in vernal pools	Potential habitat - Sutter Buttes
Giant garter snake <i>Thamnophis couchi gigas</i>	T/T	Present yearlong (breeds April-September)	Marshes, streams, sloughs of Central Valley from Butte Co. to Fresno Co. with dense vegetation and basking sites; permanent water bodies	South County, Cross Canal, NE of Sutter
BIRDS				
Cooper's hawk <i>Accipiter cooperii</i>	none/CSC	Present yearlong (breeds March-August)	Nests in second-growth conifer stands and deciduous riparian areas, usually near water, forages in patchy woodlands/ breeding resident	Sutter Buttes
Sharp-shinned hawk <i>Accipiter striatus</i>	none/CSC	September-March (primarily winter resident)	Nests on north-facing slopes in mid-elevation tree-dominated habitats (riparian, black oak, ponderosa pine, and mixed conifer) near water;	Sutter Buttes
Tricolored blackbird <i>Agelaius tricolor</i>	C2/CSC	Present yearlong (breeds March - July)	Nests in dense cattails, tules, willows, or blackberry thickets near fresh water, forages in grasslands and ag lands up to 4 miles from nest;	(historical) South County, W of Sutter Bypass, S of Meridian; (extant) NE of Buttes
Golden eagle <i>Aquila chrysaetos</i>	none/CSC, CFP	Present yearlong (breeds March-July)	Nests on cliffs and in large trees (oak savanna) on hillsides; forages over open, mountainous areas and grasslands/ 0-11,500 feet, throughout	Sutter Buttes, Sutter NWR
Great blue heron <i>Ardea herodias</i>	none/SA	Present yearlong (breeds February-July)	Nests colonially in secluded tree stands, forages in wetlands/ throughout CA; rookeries scattered, usually near water	Feather River

TABLE 9.8-5: SUTTER COUNTY SPECIAL STATUS WILDLIFE SPECIES (CONTINUED)

Species	Status (Federal/State)*	Sensitive Period**	Habitat Requirements	Known Location(s) or Examples of Potential Habitat
BIRDS (cont.)				
Short-eared owl <i>Asio flammeus</i>	none/CSC	September-April (wintering only)	Nests on ground in open annual grasslands, pastures, and seasonal wetlands, forages over adjacent areas; winters in Central Valley	Potential habitat - Sutter and Butte Sink NWRs
Long-eared owl <i>Asio otus</i>	none/CSC	Present yearlong (breeds March-July)	Nests in small trees with dense canopies in riparian thickets/oak woodlands in mid-to higher elevations of the Sierra Nevada; forages in grasslands	Potential habitat - Sutter NWR
Burrowing owl <i>Athene cunicularia</i>	none/CSC	Present yearlong (breeds March-August)	Breeds in existing burrows of fossorial mammals in open, dry grasslands with elevated perches and friable soils, usu. near water	Sutter Buttes, Sutter NWR
Aleutian Canada goose <i>Branta canadensis leucopareia</i>	T/-	Nov. - March (wintering only)	Winters on lakes and inland prairies, foraging on natural or cultivated pastures.	Butte Sink, S. of Sink
Ferruginous hawk <i>Buteo regalis</i>	C2*** /CSC	September-April (wintering only)	Winters (does not breed) in CA; forages in large, open areas of grasslands or low shrubs/ Central Valley, lower foothills	Sutter Buttes
Swainson's hawk <i>Buteo swainsoni</i>	C1/T	March-August (breeding only)	Nests in oak savanna, oak woodlands, open riparian forests, isolated trees at field edges; forages over grasslands and agricultural lands/ Central Valley and adjacent Sierra foothills	Sacramento River, Cross Channel, Feather River, Sutter Bypass
Great egret <i>Casmerodius albus</i>	none/SA	Present yearlong (breeds March-July)	Nests colonially in tall trees near perennial wetlands, forages in shallow wetlands/ coastal lowlands, inland valleys, and Central Valley	Sacramento River, Feather River
Western snowy plover <i>Charadrius alexandrinus nivosus</i>	PT/CSC	April-August (uncommon-breeding only)	Nests on dunes and areas of sand accumulation near salt water; forages in same habitat, and at isolated sites near alkalai lakes in the Central Valley	Potential habitat - Butte Sink
Northern harrier <i>Circus cyaneus</i>	none/CSC	Present yearlong (breeds April-September)	Nests on ground near emergent wetlands or in grassland; forages over grasslands/ 0-5,700 feet in Central Valley and Sierra Nevada	Sutter NWR
Western yellow-billed cuckoo <i>Coccyzus americanus occidentalis</i>	C3B/E	June-Sept (breeding only)	Nests in dense riparian forests and woodlands dominated by cottonwoods and willows, typically with a dense understory	Sacramento River, Feather River
Yellow warbler <i>Dendroica petechia brewsteri</i>	-/CSC	April-July (breeding only)	Nests and forages in open-canopied riparian woodlands (willow, cottonwood, alder) also in chaparral in open conifer forests/ up to 8,000 ft	Potential habitat - Sutter NWR, Sutter Buttes

TABLE 9.8-5: SUTTER COUNTY SPECIAL STATUS WILDLIFE SPECIES (CONTINUED)

Species	Status (Federal/State)*	Sensitive Period**	Habitat Requirements	Known Location(s) or Examples of Potential Habitat
BIRDS (cont.)				
Snowy egret <i>Egretta thula</i>	none/SA	Present yearlong (breeds March-May)	Nests in protected beds of dense tules	Sutter Buttes; Potential habitat - Butte Sink
Black-shouldered kite <i>Elanus caeruleus</i>	none/CFP,SA	Present yearlong (breeds May-August)	Nests in dense groves of trees, including oak, willow, and cottonwood near open foraging areas (open grasslands/ag lands/wetlands)/ Central Valley	Sutter Buttes
Willow flycatcher <i>Empidonax traillii</i>	FSS/E	May-June/Aug-Sept (migrants only)	Nests in riparian areas and wetlands dominated by willows/ summer resident from 2,000-8,000 feet in Sierra Nevada	Sacramento River
California horned lark <i>Eremophila alpestris actia</i>	C2/CSC	Present yearlong (breeds March - July)	Open areas, especially low, level, or rolling pastureland; nests and forages on ground where tall vegetation is absent/ CA, less common in mntns.	Sutter Buttes
Merlin <i>Falco columbarius</i>	none/CSC	September-May (wintering only)	Winters in open grasslands, savannahs, woodlands, lakes, etc.; requires trees by water for cover/ W. half of CA below 3,900 feet	Sutter Buttes
Prairie falcon <i>Falco mexicanus</i>	none/CSC	Present yearlong (breeds April-August)	Nests in cliffs adj. to open terrain; forages over savanna, grassland, and seasonal wetlands/ from SE deserts NW along inner Coast Ranges	Sutter NWR
American peregrine falcon <i>Falco peregrinus anatum</i>	E/E	September-February (wintering only)	Winters in riparian areas and near coastal and inland wetlands	Potential habitat - Sacramento River
Greater sandhill crane <i>Grus canadensis tabida</i>	none/T	September-April (wintering only)	Nests in northeastern CA; winters in Central Valley, foraging in grasslands, rice and corn croplands, and emergent wetlands	N. of Sutter Buttes, Sutter NWR
Bald eagle <i>Haliaeetus leucocephalus</i>	E/E	September-December (wintering only)	Winters in northern California, requires large bodies of water for foraging; roosts communally typ. in dense, sheltered conifer stands	Potential habitat - Sutter NWR
Yellow-breasted chat <i>Icteria virens</i>	none/CSC	May-August (breeding only)	Nests and forages in dense, brushy willow thickets near water/ coastal CA and Sierra Nevada foothills	Potential habitat - Sutter and Butte Sink NWRs
Least bittern <i>Ixobrychus exilis</i>	C2/CSC	May-July (primarily summer resident)	Requires dense perennial marshes for nesting	Potential habitat - Sutter and Butte Sink NWRs

TABLE 9.8-5: SUTTER COUNTY SPECIAL STATUS WILDLIFE SPECIES (CONTINUED)

Species	Status (Federal/State)*	Sensitive Period**	Habitat Requirements	Known Location(s) or Examples of Potential Habitat
BIRDS (cont.)				
Northern loggerhead shrike <i>Lanius ludovicianus</i>	C2/CSC	Present yearlong (breeds March-July)	Open habitats with scattered perching substrate; nests in dense oak woodlands or shrubs/ in lowlands and foothills throughout CA	Sutter Buttes
California gull <i>Larus californicus</i>	none/CSC	Present yearlong (breeds April-August)	Nests in freshwater and alkalai habitats, historically in Central Valley; winters in Central Valley and along coast, foraging in wetlands, croplands, landfills, and open lawns	Potential habitat - Sutter and Butte Sink NWRs
Long-billed curlew <i>Numenius americanus</i>	none/CSC	July-April (wintering only)	Forages near water in prairies, grassy meadows, and croplands	Sutter Buttes
Black-crowned night heron <i>Nycticorax nycticorax</i>	none/SA	Present yearlong (breeds March-July)	Nests colonially and roosts in dense-foliaged trees and dense emergent wetlands, forages in wetlands/ throughout CA lowlands and foothills	E. of Rt. 70/99
Osprey <i>Pandion haliaetus</i>	none/CSC	March-September (uncommon-breeding only)	Nests on top of large snags, dead trees, cliffs, and man-made structures usually near water/ near large water bodies in Sierra Nevada; forages over open, clear waters, preys primarily on fish	Potential habitat - Sutter and Butte Sink NWRs
Double-crested cormorant <i>Phalacrocorax auritus</i>	none/CSC	Present yearlong (breeds April-July)	Winters on lakes or Central Valley and Sierra foothills, rare colonial breeder inland from coast; breeds near water in trees, rock ledges	Feather River
American white pelican <i>Pelecanus erythrorhynchos</i>	none/CSC	October-March (wintering only)	Nests in northeastern CA; winters in Central Valley and coast, foraging in open water and roosting on the ground along edge of water	Sutter and Butte Sink NWRs
White-faced ibis <i>Plegadis chihi</i>	C2/CSC	yearlong (uncommon resident) (breeds May-July)	Nests in dense tules with shallow water	Feather River, Sutter and Butte Sink NWRs
Purple martin <i>Progne subis</i>	none/CSC	April-August (breeding only)	Nests in tree cavities, typically in isolated tree or snag in open forest or woodland, variety of wooded habitats during migration	Potential habitat - Sutter NWR
Bank swallow <i>Riparia riparia</i>	none/T	May-July (breeding only)	Nests colonially in burrows in sandy vertical bluffs and riverbanks, typ. adjacent to major waterways/ Central Valley, some areas in Sierra	Sacramento River, Feather River

TABLE 9.8-5: SUTTER COUNTY SPECIAL STATUS WILDLIFE SPECIES (CONTINUED)

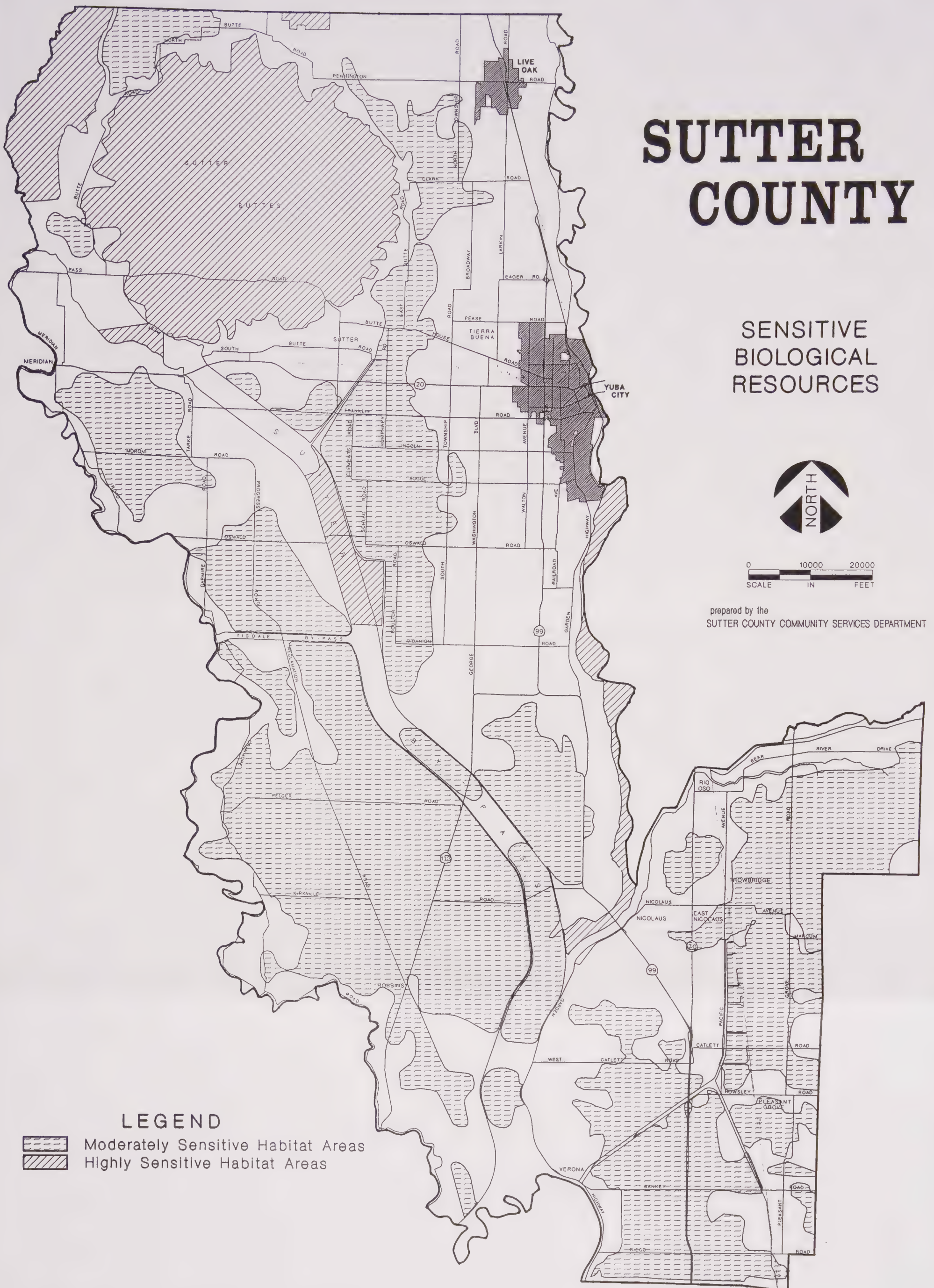
Species	Status (Federal/State)*	Sensitive Period**	Habitat Requirements	Known Location(s) or Examples of Potential Habitat
MAMMALS				
Ringtail <i>Bassariscus astutus</i>	none/CFP, CSC	Present yearlong (nocturnal/breeds May-July)	Mix of forest and shrubland with rocky areas or riparian habitats; nests typically in hollow trees/ throughout most of CA	Sutter Buttes
Greater western mastiff bat <i>Eumops perotis californicus</i>	C2/CSC	Present yearlong (breeding variable, March-Sept)	Occurs in open habitats, including grasslands and chaparral; roosts in cliff faces, buildings, trees, and tunnels	Potential habitat - Sutter Buttes
Marysville kangaroo rat <i>Dipodomys heermanni eximius</i>	C2/CSC	Present yearlong (nocturnal/breeds Feb-Oct)	Friable soils for burrowing, grass-forb stages of chaparral/grassland for forage; May be extirpated on Sutter Buttes	Sutter Buttes
San Joaquin pocket mouse <i>Perognathus inornatus inornatus</i>	none/none	Present yearlong (nocturnal/precise breeding period unknown)	Inhabits valley grassland, oak savanna, and alkaline areas in the Tulare Basin, Central Valley, and Panoche Valley	SW Sutter Buttes
Pacific western big-eared bat <i>Plecotus townsendii townsendii</i>	C2/CSC	Present yearlong (breeds May-Aug)	Occurs in a variety of habitats that contain suitable undisturbed roost sites, e.g., caves, tunnels, mines, abandoned buildings	Potential habitat - Sutter Buttes

SOURCE: Environmental Science Associates, Inc.; CNDDDB; Pierce (1993); Zeiner et.al. (1988, 1990); Audubon Society; CDFG (Gray Lodge Wildlife Management Area); Herbold, Jassby, and Moyle (1992); Anderson (1983); Sutter Ash Landfill EIR; South Sutter County FEIR; Sutter Bay EIR.

*See Table 10.8-3 for Status Definitions.

**Breeding periods may include gestation and raising of young for species that remain sensitive to disturbance during this time.

***Under petition for listing



Source: "SUTTER COUNTY Biological Resources Profile"
dated February 1, 1994 by Environmental Science Associates.

Figure 9.8-1
Sensitive Biological Resources

BIOLOGICAL RESOURCES SENSITIVITY

Purpose of Analysis

The following information is included on the Sensitive Biological Resources map, which is an overlay to the General Land Use Map and is presented as Figure 9.8-1. This information is intended to be used by Sutter County in the course of other planning processes to help identify the relative biological sensitivity of specific areas within the County.

Classification System Development

A simple three-tiered biological sensitivity classification system of all Sutter County lands was developed based on the presence, extent, expected function, relative sensitivity, and overall importance (including local and regional values) of individual vegetation communities within Sutter County. An assessment was made of each vegetation community's potential to harbor special status species, based on habitat requirements and available occurrence records. When assigning value to a resource area, consideration was given to several factors, including the location of the resource with respect to other sensitive resources (e.g., potential for providing wildlife movement corridors); the potential for/feasibility of mitigation of biological impacts based on current knowledge and practice; and the legal status of the resource (under local, State, or Federal policy or regulation).

In the absence of site-specific biological field investigations performed over the entire County, the quality, function, and value of individual community occurrences could not be assessed individually in order to refine the analysis. For example, the ecological value of seasonal wetlands is highly variable, largely depending upon degree of disturbance, the size and floristic composition of the specific community, as well as its relation to other natural communities. The following assessment was based on examination of representative areas and communities during a three-day ground-truthing effort in January 1994, aerial photograph interpretation, review of existing data, and knowledge of local biology, as described in Section 2. Site-specific field work will be required to more precisely determine the value of a particular location within the study area. The following sections explain the criteria used for ranking biological constraints in the study area.

Sensitivity Criteria

All areas within the County were designated as high, medium or low natural habitat value. Thus the three categories are labeled High sensitivity-high habitat value, Moderate sensitivity-moderate habitat value and Low sensitivity-relatively low habitat value. The higher the relative value, the more stringent should be the planning constraints against land use conversion. Within each category, several habitat types are described, but they are not ranked with respect to each other. It is important to note that the distinction between areas of high sensitivity and moderate sensitivity is much greater than that between areas of moderate sensitivity and low sensitivity.

High Sensitivity - High Habitat Value

In general, areas with this designation fall into one of three types: 1) Sensitive Natural Community, i.e., a vegetation community that is identified by the Non-Game Natural Heritage Division of the CDFG as rare or sensitive; 2) an area known to provide appropriate habitat for one or more special status plant or animal species; or 3) conservation area; a protected area subject to State or Federal permitting requirements.

Sensitive Natural Communities

Biological impacts to these communities are not often mitigated successfully because of a lack of available habitat for replacement, site-specific edaphic (soil composition) requirements, the lengthy period required to achieve maturity, or because methods of restoration/re-creation are still experimental.

Examples in Sutter County:

- Riparian corridors (Feather River, Sacramento River)
- Freshwater Marsh (Butte Sink)
- Vernal Pool (on Sutter Buttes)

Known Special Status Species Natural Habitat Area

Natural communities or even a spot location that is known habitat for one or more special status species.

Example in Sutter County:

- Heron rookery (Sacramento River in southwest county, black-crowned night heron in southeast county)

Conservation Areas

An area recognized and protected by a federal, state, or local agency or group as a nature refuge or sanctuary; previously dedicated or established as a biological mitigation or conservation area; or an area widely recognized as a valuable ecological resource.

Examples in Sutter County:

- Sutter National Wildlife Refuge
- Sutter Buttes
- Butte Sink
- Bobelaine Audubon Sanctuary
- CDFG Feather River Management Unit (includes Abbott Lake, O'Connor Lake, and Nelson Slough)

Moderate Sensitivity - Moderate Habitat Value

Three kinds of areas in Sutter County are judged to have moderate sensitivity and habitat value: 1) potential habitat for sensitive species, 2) degraded wetlands, and 3) specialized agricultural land of value to sensitive species.

Potential Sensitive Species Habitat

A location of a native vegetation association that is not identified by the Non-Game Natural Heritage Division of the CDFG as rare or sensitive or is not expected to be well-developed in terms of plant and animal species' composition, BUT may yet provide suitable habitat for one or more special status plant or animal species.

Examples in Sutter County:

- Immature, fragmented, or isolated, somewhat degraded sensitive habitats
- Vernal pools in grazed pasture

Degraded Wetlands

A waterway or waterbody over which the Corps and CDFG may have jurisdiction, but which does not support mature woody riparian vegetation or a predominance of herbaceous hydrophytes (water-dependent vegetation). Generally, such features have either been created or modified through human activities (e.g., livestock grazing or channelization).

Enhancement or rehabilitation can be successfully accomplished, typically within a five-year period. Mitigation for displacement of such features generally can be accomplished more rapidly and at a much lower cost than for more valuable resources described under High Sensitivity.

Examples in Sutter County:

- Unvegetated/poorly vegetated waterways (portions of Sutter Bypass)
- Man-made wetlands/water bodies

Particular Agricultural Lands as Habitat for Special Status Species

An agricultural community type that provides habitat for wildlife, including special status animal species such as the giant garter snake.

Example in Sutter County:

- Rice fields and associated waterways (This includes areas currently under row or field crops but that are adjacent to rice fields and have been or can be used to grow rice in other years.)

Low Sensitivity - Relatively Low Habitat Value

Two area types are considered to have relatively low (but may have some) biological sensitivity.

Widespread Natural Habitat

A widespread resource not identified as in decline by any local, State, or Federal resources agency, and that generally provides relatively low value to wildlife. Such a community typically is not appropriate habitat for special status plant or animal species and/or reestablishes quickly after disturbance; consequently, such a community can be readily rehabilitated or enhanced.

Example in Sutter County:

- Non-native grassland (This habitat type is of some habitat value but can recover and be readily rehabilitated or enhanced.)

Developed or Under Cultivation

Areas developed or converted to agricultural use (excluding areas noted above under Moderate Sensitivity as providing special status species' habitat).

Examples in Sutter County:

- Residential-Park (urbanized and landscaped areas)
- Row or field crops, orchards
- Irrigated pasture

BIOLOGICAL REGULATORY FRAMEWORK

Special Status Species Protection

Special status species include those listed by the Federal or State governments as rare, threatened, endangered, candidate or proposed for listing; species listed by the California Native Plant Society (CNPS) as rare or endangered; and species of special concern to the California Department of Fish and Game (CDFG). These species have varying degrees of legal protection under both Federal and California Endangered Species Acts (FESA and CESA), and the California Environmental Quality Act (CEQA). The United States Fish and Wildlife Service (USFWS) and the CDFG share responsibility for management and protection of biological resources in California. Under separate State and Federal legislation, each lead or responsible agency conducts a detailed review of any project that could affect a special status plant or animal species. If a species listed as endangered or threatened may be affected, the lead agency must initiate a formal consultation with the USFWS and/or CDFG, as applicable under Federal or State law.

Sections 7 and 10(a) of the Federal Endangered Species Act (16 USC 1531 et seq.) require formal consultation only on those species currently listed as threatened or endangered. The USFWS recommends candidate species also be considered because they may become listed during the design or construction phases of a project. Section 9 of the Act prohibits the "taking" of listed species. If incidental taking might occur from a project, that is, if individuals of a listed species would be inadvertently harmed, harassed, or collected, killed or would suffer significant habitat modification, consultation with the USFWS is required.

Additionally, a formal consultation process must be initiated with the CDFG for projects the state lead agency has determined may or will have an adverse effect on state-listed species. As with USFWS policy, candidate species are not subject to the same consultation requirements as listed, endangered or threatened species. CESA encourages informal consultation for candidate species which may become officially listed prior to completion of the CEQA process.

In addition to providing formal and informal consultation, the CDFG has established the California Natural Diversity Data Base - RareFind (CNDDB), a program that inventories the State's special status species and natural communities, and also provides information on their current listing status.

The CDFG has also developed a list of wildlife "Species of Special Concern." These species are defined as having California breeding populations which are of special concern in that they may face extinction within the State in the near future. By so designating a species, the CDFG draws attention to the potential for future listing of such species to a more protected status.

The CNPS publishes and periodically updates the *Inventory of Rare and Endangered Vascular Plants of California*. The CNPS gathers information from the CDFG and from amateur and professional botanists throughout the State, and contributes this information to the CNDDB. The Inventory has become the standard reference on California's Sensitive Plant species. Plants listed by CNPS on List 1A, 1B, or 2, but not officially listed by the State, nevertheless can receive protection under CEQA; substantial effects to these CNPS-listed species are considered to be significant.

Finally, California Fully Protected Species are bird species which, although not listed as endangered or threatened, are protected by law in California. Under Section 3511 of the Fish and Game Code, it is illegal to take, harass, or possess these species, their nests, or their eggs. These species, as well as other bird species, are afforded further protection under Sections 3503 (protection of nests and eggs), 3503.5 (protection of raptor eggs), and 3513 (protection of migratory birds) of the Fish and Game Code and the Migratory Bird Treaty Act of 1914, respectively.

Wetlands Protection

When proposing development that may affect potential jurisdictional areas on a site, it is necessary to determine the extent to which "waters of the United States" exist on the property. Using this information, a written request would be made to the Chief of the Regulatory Section, Corps of Engineers, accompanied by a description of the property and a map documenting the findings of a preliminary wetland delineation. The Corps would analyze this information, conduct their own field visit to confirm the preliminary wetland delineation, and formally identify the extent of the Corps' jurisdiction subject to Section 404 permit requirements on the site.

Section 404 of the Federal Clean Water Act regulates discharge of fill material into "waters of the United States," which include wetlands. The U.S. Army Corps of Engineers (Corps) is responsible for issuance of a permit for any project that proposes filling of between one and ten acres of wetlands. Filling of less than one acre of wetlands requires no formal notification of the Corps, and would be automatically permitted under a Department of the Army Nationwide Permit No. 26, provided certain conditions are met. The Environmental Protection Agency (EPA) has an oversight role, and through an involved process, can override a decision by the Corps to issue a permit. Certain activities such as normal farming practices, emergency reconstruction of existing structures, and construction of irrigation ditches are exempt from Section 404 permit requirements.

Once the official extent of the Corps' jurisdiction is known, the next step is to determine whether there are practical alternatives, either on- or off-site, that would avoid filling wetlands or minimize filling wetlands, such as project alteration. Only as a last resort would the Corps and EPA accept creation of new wetlands or enhancement or restoration of existing wetlands as mitigation. This sequencing of mitigation is generally in keeping with the current Federal policy of "no net loss" of wetland acreage.

The Corps' current Nationwide permit program, specifically Nationwide Permit No. 26 (33 CFR Section 330.5), provides a mechanism for processing and review of activities which would affect fewer than ten acres of wetland and other waters in areas that lie "above the headwaters." Headwaters are defined as having a mean annual flow of five cubic feet per second or less (33 CFR Parts 320 through 330), or a flow of less than five cubic feet per second more than 50 percent of the time.

If one to ten acres of wetland fall within this definition, the Corps must be notified of any proposed action that would fill a wetland. The Corps may elect to process an individual permit or allow the proposed wetland fill to proceed under the Nationwide Permit. Generally, the closer the proposed fill area is to one acre, the greater the probability that a Nationwide Permit may be issued. For filling of wetlands which fall outside this definition and/or are greater than ten acres, an application for an individual permit must be filed with the Corps, requiring a thorough environmental and public interest review and public notice prior to the issuance or denial of a permit. The Corps would issue a public notification allowing for a 40-day comment period for the appropriate agencies and for the public. If less than one acre "lies above the headwaters" and meets the other conditions of the Nationwide permit program, no formal notification to public agencies or public review is required. Additionally, in July of 1995, the Army Corps of Engineers issued a nationwide permit for filling of wetlands in conjunction with residential land uses. This permit allows the filling of up to one-half acre of non-tidal wetland within a property containing a single-family residence. The permit lists numerous conditions under which such wetland filling is not allowed, including on wild and scenic rivers, in coastal zones and in the vicinity of threatened or endangered species.

To determine which wetlands are subject to Corps' jurisdiction (i.e., jurisdictional wetlands), a wetlands delineation must be performed. The criteria for determining whether land is designated as "wetlands" has been the subject of considerable debate in recent years. In 1989 the Corps, EPA, the Soil Conservation Service and the U.S. Fish and Wildlife Service published a "unified" method for wetland delineation based upon soil type, presence of certain plant species and below surface saturation for more than seven consecutive days within a year.

Public and legislative backlash to the rather liberal definition of wetlands led the four agencies to revisit the terms under which wetlands are defined. Ultimately, these efforts were abandoned and former methods of wetland delineation were reinstated. Currently, the U.S. Fish and Wildlife Service is recommending that the Service's Classification of Wetlands and Deepwater Habitats of the United States, (Cowardin, 1979) be used to delineate wetlands. The Army Corps of Engineers has reverted to using its 1987 manual to identify and delineate wetlands potentially subject to Section 404 regulation.

The Regional Water Quality Control Board (RWQCB) can require a project proponent to obtain a Section 401 (Clean Water Act) water quality certification for Nationwide permits granted by the Corps. For less than one acre, the Board issues a waiver, provided the applicant is also applying to the California Department of Fish and Game for a Stream Alteration Agreement as noted below. The RWQCB has 60 days to issue this waiver. Between one and two acres, a waiver could also be issued but only after a thorough review of any agency or public comments during the 40-day comment period on the Corps' public notice (assuming that the Corps has required an individual permit). For more than two acres of wetland removal, the RWQCB requires a mitigation plan, a public hearing, and approval of the water quality certification by the State Water Resources Control Board as an item on their agenda.

CDFG also has authority to oversee work within natural stream channels pursuant to Fish and Game Code Sections 1601 to 1603. A landowner or agency proposing to substantially divert the natural flow of a stream, substantially alter its bed or bank, or use any material from the streambed, must first enter into a "Streambed Alteration Agreement" (SAA) with CDFG. The CDFG, while being able to impose reasonable conditions on the agreement, may not decline to enter into an agreement. A SAA will only be entered into by the CDFG once all other project permits and certifications are obtained. When a SAA is required, construction cannot be initiated on the site until the SAA is executed.

9.9 FINDINGS

Agricultural Resources

- Between 1987 and 1992 the number of farms and acres of farmland in Sutter County decreased, while the total value of farm products increased. However, the amount of developed land remains below 4% of the total County land area.
- Prime agricultural lands and lands of statewide significance total 275,998 acres, or roughly 71% of the total area of Sutter County.
- The County's agriculturally related economic base could be jeopardized by the conversion of agricultural land to urban uses and through incremental divisions of agricultural land for rural residential uses unless appropriate measures are taken.
- Urbanization often results in conflicts between agricultural and non-agricultural land uses.

Forest Resources

- Sutter County contains very limited forested area that provides vital wildlife habitat in an otherwise intensively farmed county.

Mineral Resources

- According to the California Division of Mines and Geology, the County does not contain any significant or substantial deposits of mineral resources.

Natural Gas Resources

- As of November 1995, Sutter County produces approximately five percent of all the natural gas produced in California from 252 wells in 19 gas fields.

Water Resources

- Water is a vital component of the agricultural industry for Sutter County.
- Several areas of the County have experienced pumping depressions of groundwater, some as a result of groundwater pumping in adjacent counties.
- Surface water supplies are critical to the preservation of Sutter County's agricultural industry as well as the conservation of groundwater resources.
- Preservation of local water rights is crucial to the long-term viability of both urban and agricultural uses in Sutter County.

Biological Resources

- Sutter County contains a variety of vegetation types that provide valuable habitat for many wildlife species.
- Agricultural land uses provide limited but important habitat and forage opportunities for selected wildlife species.
- The Sacramento and Feather Rivers provide critical habitat for a number of sensitive and State and Federally listed species.
- The Butte Sink is one of the largest riparian wetland remaining in California.
- The Sutter Buttes comprise a unique biological resource that contains a variety of diverse habitats of high sensitivity.

- The portion of the Feather River, north of its confluence with the Bear River, supports the largest remaining contiguous example of mixed-riparian forest in the Central Valley.
- Public improvement projects, including public landscapes, parks and other public facilities offer opportunities for providing wildlife habitat.

Air Quality

- There are two sources of air quality problems in Sutter County: PM10 (inhaled particulate matter) and ozone.
- An overall increase in stationary and mobile emission sources will occur in Sutter County in spite of new, more stringent and improving emission control devices and retrofitting stationary emission sources.
- The direction and ultimate form of physical development in Sutter County will affect air emissions.
- Future Federal and State air quality requirements could reduce land use options for the County.

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CHAPTER 10

SAFETY

10.1 INTRODUCTION

This chapter contains information on seismic hazards, including a review of the geologic setting of the County, a compilation of active and potentially active earthquake faults in or near the County, and an assessment of the potentially hazardous effects of earthquakes. Also included in this chapter is information on other geologic hazards, including erosion potential, subsidence, landslides, expansive soils and volcanic hazards. This chapter also reviews structural hazards and critical facilities, fire hazards, emergency response, flood hazards and dam safety, solid and hazardous waste management, and airport safety.

10.2 SEISMIC SAFETY

GENERAL GEOLOGIC SETTING OF SUTTER COUNTY

The topography of Sutter County is comprised primarily of the gentle flatlands of the Sacramento River Valley. The only prominent topographic eminence within the County is the Sutter Buttes, a Pliocene volcanic plug which rises abruptly 2,000 feet above the surrounding valley floor. The surface expression of the County's geology governs the extent to which various geologic hazards may (or may not) constitute a threat to life and property within the County.

Sutter County is part of the Great Valley geomorphic province. The Great Valley province is the geologic term for the central valley of California which is drained by the Sacramento River in the North and by the San Joaquin River in the south. The central valley extends nearly 500 miles north and south and averages about 40 miles in width between the Coast Ranges on the west and the Sierra Nevada on the east. Geologically, the Great Valley province is characterized by a great thickness of generally flat-lying sedimentary rocks overlain by alluvial soils. The alluvial soils of the Central Valley range in thickness from a few inches near the foothills to more than 200 feet near the Sacramento River. In Sutter County, the sedimentary rocks are of both marine and continental origin frequently imbedded within tuff-braccias. The continental sediments of the Pleistocene and Recent ages consist of as much as 100 feet of Pleistocene sands and gravels overlaid by 125 feet of recent alluvial fan, flood plain, and stream channel deposits.

The Sutter Buttes, located northwest of Yuba City, form an isolated topographic island within Sutter County and are the most prominent igneous feature in the Great Valley. The Buttes are circular in shape, about 10 miles in diameter. They consist of a central volcanic core of andesite porphyry and tuff surrounded by a ring of sediments, and these sediments are embraced in turn by a ring of andesite tuff and braccia which extends to the Valley alluvium. The volcanic activity that created the Sutter Buttes appears to have occurred in the Early to Middle Pleistocene (between 2.4 and 1.6 million years ago) and the youngest volcanic domes were emplaced by 1.6 to 1.4 million years ago.

FAULT CLASSIFICATIONS

The California Mining and Geology Board has defined **active faults** as those for which there is evidence of surface displacement within the Holocene epoch; that is, within about the last 11,000 years. Some faults are characterized as active based on surface displacements within historic time, about the last 200 years, while others are characterized as active based on surface displacements in rocks or sediments which are less than 11,000 years old. This definition of active fault does not mean, however, that all faults for which there is no evidence of surface displacement during the Holocene are inactive. Some faults may have been active in this time period, but did not result in identifiable surface displacements, while other faults may still be active although they have not been active during the Holocene. Many recent, damaging California earthquakes including the 1975 Oroville earthquake, the 1983 Coalinga earthquake, and the 1987 Whittier Narrows earthquake occurred on faults not previously recognized as active.

The Mining and Geology Board has defined **potentially active faults** as those for which there is evidence of surface displacement within the Quaternary period, that is, within about the last 1.6 million years. Faults classified as potentially active faults show no evidence of surface displacements within the past 11,000 years, but this period of time is short geologically and thus such faults are considered potentially active. Faults which do not meet these criteria for being classified as active or potentially active are not necessarily permanently inactive.

Seismic risk is not limited to faults which have been currently identified. A significant fraction of small to moderately large earthquakes typically occur on faults not previously recognized. Such earthquakes are characterized as "background seismicity" or "floating earthquakes" which indicate that the expected sources and locations of such earthquakes are unknown.

Earthquake "**magnitude**" is a measure of the total amount of energy released in an earthquake. With increasing magnitude (i.e., larger earthquakes) ground motions are stronger, last longer, and are felt over larger areas. Earthquake "**intensity**" is a measure of the effects of earthquake ground motions on people and buildings. Earthquake intensity is often more useful than magnitude when discussing the damaging effects of earthquakes. The most common intensity scale is the Modified Mercalli Intensity (MMI) scale, which ranges from I to XII.

Table 10.2-1 describes the effects of earthquakes and compares the Richter Scale (magnitude) to the Modified Mercalli Scale (intensity).

Active Faults

No active earthquake faults are known to exist in Sutter County. Regionally, active faults could generate ground motion felt within Sutter County. Figure 10.2-1 is a regional fault map which includes Sutter County in relationship to fault locations. Table 10.2-2 lists key information about important active and potentially active, local and regional faults.

Numerous earthquakes of magnitude M 5.0 or greater have occurred on regional faults, primarily those within the San Andreas Fault System. The west side of the Central Valley is a seismically active region. The greatest historical amount of ground shaking along the west side of the Sacramento Valley resulted from the April 1892 earthquakes in the vicinity of Vacaville and Winters. The 1892 earthquakes are believed to have been produced by the Coast Range - Central Valley blind thrust fault located along the western margin of the valley, parallel to and west of Interstate 5, and about 20 to 30 kilometers west of Sutter County. The estimated magnitude (based on reported intensities) are in the range of M 6.5. For the period 1900-1974, two earthquakes of magnitude M 4.0 and M 4.9 had epicenters just west of Interstate 5 and north of Highway 20 near Williams.

Moderate to large earthquakes in the Foothills Suture Zone along the west slope of the Sierra Nevada are relatively rare. However, a magnitude M 5.7 earthquake occurred in 1975 on the Cleveland Hill Fault in the northern portion of the Zone, in Butte County. This fault up to that time had not been considered active.

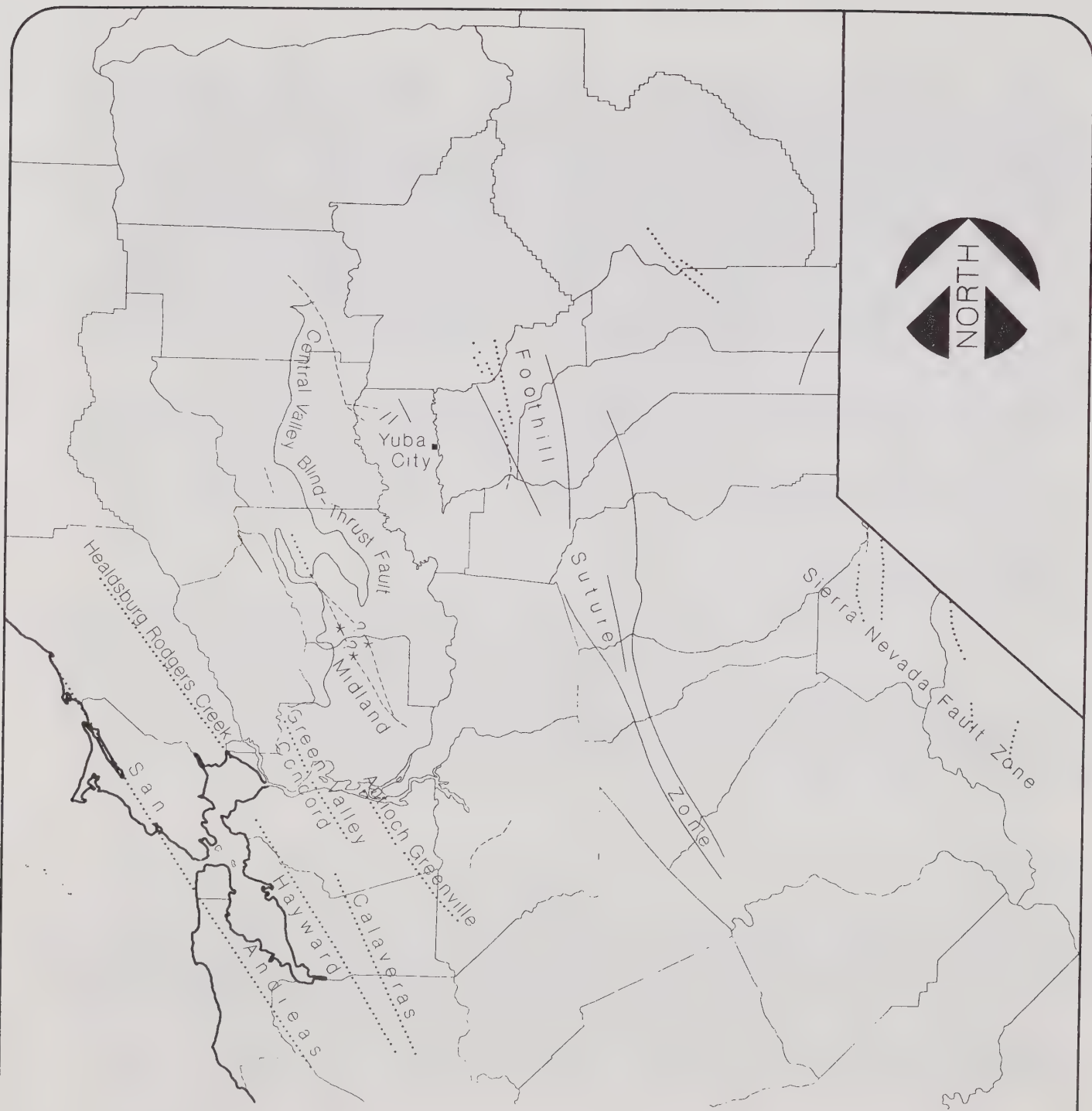
Potentially Active Faults

Known fault locations within Sutter County are considered to be potentially active faults. A series of small faults within the Sutter Buttes exhibit evidence of Quaternary motion (within the past 1.6 million years). Generally, movements on these faults were associated with deep-seated volcanism, but may have been partially related to other crust-deformation processes. The faults are not considered active. Refer to Table 10.2-2 for a list of potentially active faults.

PREDICTED EFFECTS OF EARTHQUAKES

Ground Shaking

Based on the known active faults and potentially active faults in the region, Sutter County has the potential to experience low to moderate ground shaking. The intensity of ground shaking at any specific site depends on the characteristics of the earthquake, the distance from the earthquake fault, and on the local geologic and soils conditions. At present there are insufficient data to predict accurately the expected ground motions at various locations within Sutter County.



SUTTER COUNTY

LEGEND

- Fault
- Approximately Located or Inferred Fault
- - - - - Fault Concealed by Younger Rocks
- - - ? - - - Fault Continuation or Existence Uncertain
- * Epicenter of 1892 Sequence

TABLE 10.2-1
RELATIONSHIP OF MODIFIED MERCALLI SCALE TO RICHTER SCALE

Richter Magnitude Scale	Modified Mercalli Scale	Effects of Intensity
0.1 - 0.9	I	Earthquake shaking not felt.
1.0 - 2.9	II	Shaking felt by those at rest.
3.0 - 3.9	III	Felt by most people indoors; some can estimate duration of shaking.
4.0 - 4.5	IV	Felt by most people indoors. Hanging objects rattle, wooden walls and frames creak.
4.6 - 4.9	V	Felt by everyone indoors; many estimate duration of shaking. Standing autos rock. Crockery clashes, dishes rattle, and glasses clink. Doors open, close and swing.
5.0 - 5.5	VI	Felt by all who estimate duration of shaking and direction. Sleepers awoken, liquids spill, objects displaced, weak materials crack.
5.6 - 6.4	VII	People frightened and wall unsteady. Pictures and books thrown, dishes/glass are broken. Weak chimneys break. Plaster, loose bricks and parapets fall.
6.5 - 6.9	VIII	Difficult to stand, waves on ponds, cohesionless soils slump. Stucco and masonry walls fall. Chimneys, stacks, towers and elevated tanks twist and fall.
7.0 - 7.4	IX	General fright as people thrown down. Hard to drive, trees broken, damage to foundations and frames. Reservoirs damaged. Underground pipeline broken.
7.5 - 7.9	X	General panic, ground cracks, masonry and frame buildings destroyed. Bridges destroyed, dams, dikes and embankments damaged. Railroads bent slightly.
8.0 - 8.4	XI	Large landslides, water thrown, general destruction of buildings, pipelines destroyed, railroads bent.
8.5 +	XII	Total nearby damage, rock masses displaced. Lines of sight/level distorted. Objects thrown into air.

Source: K.V. Steinbrugge, 1982, Earthquakes, Volcanoes and Tsunamis, and Anatomy of Hazards

TABLE 10.2-2
LOCAL AND REGIONAL FAULTS

<u>Fault</u>	<u>Most Recent Significant Earthquake Year; Richter Scale Magnitude</u>
Sutter Buttes	Quaternary
Dunnigan Hills (near Arbuckle)	Holocene
Foothills Suture Zone Cleveland Hill Swain Ravine-Spenceville	1975; M 5.7
Midland	Quaternary
Unnamed (1892 epicenters between Vacaville and Winters)	1892; M 6.7 1892; M 6.5
Green Valley-Concord-Calaveras	1984; M 6.1 1979; M 5.9
Rodgers Creek-Hayward	1968; M 6.8 1936; M 7.0
San Andreas	1989; M 7.1 (Loma Prieta) 1906; M 8.3
Eastern Sierra Nevada Sulphur Creek Stampede Valley Genoa	1875 1966 Holocene

Source: Environmental Science Associates, Proposed Ash Landfill EIR, 1992

Liquefaction Potential

Liquefaction, which may occur under strong ground shaking during earthquakes, is the transformation of a granular sediment or fill material from a solid state to a temporarily liquid state. Liquefaction is a serious hazard because buildings on ground which undergoes liquefaction may sink or suffer major structural damage. Evidence of liquefaction may be observed in "sand boils", which are expulsions of sand and water from below the surface due to increased pore-water pressure below the surface. Liquefaction during an earthquake requires strong shaking continuing for a long time period and loose, clean granular materials (particularly sands) that may settle and compact because of the shaking.

Areas paralleling the Sacramento River, Feather River and Bear River which contain clean sand layers with low relative densities coinciding with a relatively high water table are estimated to have generally high liquefaction potential. Granular layers underlying certain areas in the Sacramento Valley have higher relative densities and thus have moderate liquefaction potential. Clean layers of granular materials older than Holocene are of higher relative densities and are thus of low liquefaction potential. Areas of bedrock, including the Sutter Buttes have no liquefaction potential, although localized areas of valley fill alluvium can have moderate to high liquefaction potential.

Seiches

A seiche is a periodic oscillation of a body of water such as a reservoir, river, lake, harbor or bay resulting from seismic shaking or other causes such as landslides into a body of water. The period of the oscillation varies depending on the size of the body of water and may be several minutes to several hours. Depending on the magnitude of the oscillations, seiches can cause considerable damage to dams, levees, and shoreline facilities. The potential for seiches in Sutter County is low as a predicted effect of an earthquake since groundshaking in Sutter County is low to moderate and no reservoirs or dams are located in the County. The County is surrounded by the Feather River and the Bear River on the east and the Sacramento River on the west which could be subject to seiches corresponding to the potential risk of groundshaking.

Landslides

The general potential for landslides in Sutter County is discussed in the Geologic Hazards section of this element. Earthquakes may initiate landslides, particularly during the wet season, in areas of high water or saturated soils. The most likely areas for earthquake-induced landslides are the same areas of high landslide potential discussed in the Geologic Hazards section.

Dam Safety

Earthquakes can endanger dams in several ways, including failure of the foundations or dams themselves due to ground failures. Sutter County does not contain any dams large enough or located such that failure would result in any significant property damage. Dam safety, including seismic safety, is discussed under the Flooding and Dam Safety section of this element and includes a list of dams which could cause varying degrees of inundation in Sutter County if they failed.

10.3 GEOLOGIC HAZARDS

EROSION

Erosion is a two-step process by which soils and rocks are broken down or fragmented and then transported. The breakdown processes include mechanical abrasion, dissolution, and weathering. Water is the dominant agent of erosion and is responsible for most of the breakdown processes as well as most of the transport processes that result in erosion. Wind may also be an important erosion agent. The rate of erosion depends on many variables including the soil or rock texture and composition, soil permeability, slope, extent of vegetative cover, and precipitation amounts and patterns.

Erosion increases with increasing slope and increasing precipitation and with decreasing vegetative cover. Erosion may be extremely high in areas where protective vegetation has been removed by fire, construction, or cultivation. High rates of erosion may have several negative impacts including degradation and loss of agricultural land, degradation of streams and other water habitats, and rapid silting of reservoirs.

The vulnerability of natural soil types to erosion (erodibility) has been mapped by the U.S. Soil Conservation Service in a Soil Survey for Sutter County and indicates the rate at which soil may be eroded naturally. Potential erosion hazard has been grouped in three generalized categories. More specific information by soil type is contained in the Soil Survey for Sutter County.

Slight	82.9 % of Sutter County soil types have been identified in the Soil Survey as having slight erodibility and generally consist of those soil types with slopes of 0-9 percent.
Moderate	10.4 % of Sutter County soil types have been identified in the Soil Survey as having moderate to high erodibility and generally consist of those soil types with slopes of 9-30 percent.
High	5.6 % of Sutter County soil types have been identified in the Soil Survey as having high to very high erodibility and generally consist of those soil types with slopes of 30-75 percent.

1.1 % of Sutter County is water.

The moderate and high groups contain soil types found in the Sutter Buttes. It should be noted that there are some naturally erodible soil types in the moderate and high groups which do not have slopes as high as 9 to 75 percent.

With the exception of moderate to high erosion in the Sutter Buttes, the following factors make Sutter County an area of low erosion activity:

- 1) Sutter County's average annual precipitation is 15-20 inches;

- 2) Wind velocity is low in the winter (the time of highest precipitation);
- 3) With the exception of the Sutter Buttes, Sutter County does not have slopes in excess of 9 percent; and
- 4) The naturally erodible soil types are located in the Sutter Buttes

SUBSIDENCE

Subsidence is the sinking of a large area of ground surface in which the material is displaced vertically downward, with little or no horizontal movement. Subsidence, usually as a direct result of groundwater withdrawal or oil and gas withdrawal is common in several areas of California, including parts of the Sacramento Valley and in large areas of the San Joaquin Valley. Subsidence is a greater hazard in areas where the subsurface geology includes compressible layers of silt and clay. Subsidence due to groundwater withdrawal generally affects larger areas and presents a more serious hazard than does subsidence due to oil and gas withdrawal. However, localized subsidence due to oil and gas withdrawal has been observed at numerous locations in California, primarily in the Los Angeles basin.

In portions of the San Joaquin Valley, subsidence has exceeded 20 feet over the past 50 years. In the Sacramento Valley, preliminary studies suggest that much smaller levels of subsidence, 0.5 to two feet may have occurred. In most of the valley, elevation data are inadequate to determine positively if subsidence has occurred. However, groundwater pumpage in the Sacramento Valley has been increasing and groundwater levels have declined in some areas.

The amount of subsidence caused by groundwater withdrawal depends on several factors, including: 1) the extent of water level decline, 2) the thickness of the water-bearing strata tapped, 3) the thickness and compressibility of silt-clay layers within the vertical sections where groundwater withdrawal is occurring, 4) the duration of maintained groundwater level decline, 5) the number and magnitude of water withdrawals in a given area, and 6) the general geology and geologic structure of the groundwater basin.

The damaging effects of subsidence include gradient changes in roads, streams, canals, drains, sewers, and dikes. Many such systems are constructed with slight gradients and may be significantly damaged by even small elevation changes. Other damaging effects include damage to water wells resulting from sediment compaction and increased likelihood of flooding of low-lying areas.

Sutter County is not subject to high subsidence. A number of the previously described factors needed to cause subsidence do not exist in Sutter County. A list of the factors contributing to the low subsidence potential are described below:

- 1) Although Sutter County does contain several natural gas withdrawal locations in the western and southern portions of the County, these gas fields are spread out over a large area (not producing concentrated drawdowns) and do not individually generate a high volume of gas. See Energy - Oil and Gas for more information on natural gas wells;

2) Although Sutter County does have groundwater drawdowns for domestic and agricultural water supply, the subsurface geology of the County has a significant recharge capability from the Sacramento River, the Feather River and runoff from the Sierra Nevada snow melt;

3) A large portion of Sutter County households (in Yuba City and Live Oak) do not rely on groundwater since the public water supply is delivered from surface withdrawal off the Feather River;

4) Sutter County does not have oil withdrawal drawdowns.

Future potential for subsidence in Sutter County could result from prolonged periods of drought and a significant increase in natural gas withdrawal.

LANDSLIDES

Landslides are downward and outward movements of slope forming materials which may be rock, soil, artificial fill, or combinations of such materials. The size of landslides varies enormously, from tiny slides containing less than a cubic yard of material to massive slides containing millions of cubic yards. Large landslides may move down slope for hundreds of yards, or even several miles. A landslide may move rapidly or so slow that a change of position can be noted only over a period of weeks or years. A similar, but much slower, movement is called creep.

The susceptibility of a given area to landslides depends on a great many variables. However, the general characteristics which influence landslide hazards are well understood and thus it is possible to map areas in terms of general susceptibility to landslides. Among the important factors which govern the formation of landslides are:

- Steepness of slope - landslides usually occur on moderate to steep slopes.
- Type of slope material - loose, unconsolidated soils and soft, weak rocks are more hazardous than are firm, consolidated soils or hard bedrock.
- Structure and physical properties of materials - the orientation of layering and zones of weakness relative to slope direction strongly affect landslide potential.
- Water content - increasing water content increases landslide hazard because water decreases resistance to sliding and adds weight to the materials on a slope.
- Amount of vegetation - abundant vegetation with deep roots increases slope stability.
- Proximity to areas undergoing rapid erosion or man-made cuts- undercutting slopes may greatly increase landslide potential.
- Earthquake ground motions - strong ground motion may trigger landslides in marginally stable slopes or loosen slope materials and thus increase the risk of future landslides.

With the exception of the Sutter Buttes, Sutter County is located in a nil zone on a severity scale ranging from nil to high. These zones reflect an estimate of the relative amount of landslides for an area in California and don't preclude the possibility of nil zones having localized instances of landsliding. The Sutter Buttes are considered to be in a low zone as shown in Bulletin 198 by the California Division of Mines and Geology.

EXPANSIVE SOILS

Expansive soils are soils which have a potential to undergo significant changes in volume, either shrinking or swelling, with changes in moisture content. Periodic shrinking and swelling of expansive soils can cause extensive damage to buildings, other structures and roads. The potential volume change of an expansive soil is governed by the moisture content and the percentage and type of clay minerals present in the soil. Soils composed only of sand and gravel have no potential for volume change due to moisture change. Soils containing clays have variable potential for volume changes. Such soils are generally classified into three expansive soils classes with low, moderate, and high potential for volume changes:

- Low - This soils class includes sands and silts with relatively low amounts of clay minerals. Sandy clays may also have low expansion potential, if the clay is kaolinite. Kaolinite is a common clay mineral.
- Moderate - This class includes silty clay and clay textured soils if the clay is kaolinite and also includes heavy silts, light sandy clays, and silty clays with mixed clay minerals.
- High - This class includes clays and clay with mixed montmorillonite, a clay mineral which expands and contracts more than kaolinite.

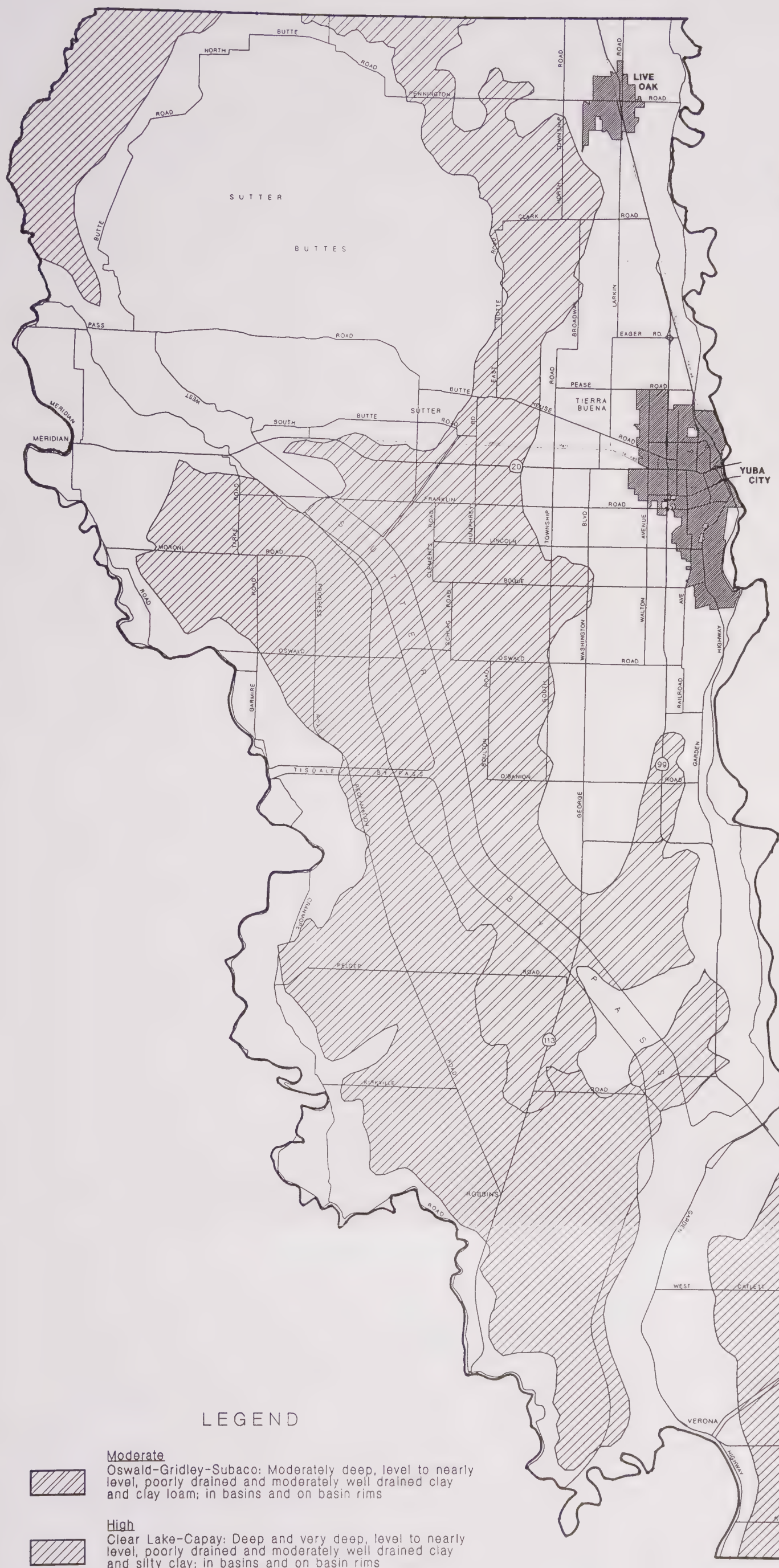
The distribution of expansive soils within Sutter County are most likely to occur in basins and on basin rims as shown in Figure 10.3-1. Soils with no or low expansion potential occur along the rivers and river valleys and on steep mountain slopes. The Soil Survey for Sutter County identifies the shrink-swell potential for soil types in the County. Several soil types have a combination shrink-swell potential meaning that the potential for shrink-swell changes at varying soil depth. Generally, 34 % of soil types in Sutter County have a high potential and 22.8 % have a low potential. The rest of the soil types could not be clearly placed into high, moderate or low categories due to changes in potential shrink-swell capacities at varying soil depths.

VOLCANIC HAZARDS

The most probable centers of future volcanic eruptions generally lie along the eastern margin of California, with the greatest concentrations in northeastern California and along the eastern margin of the Sierra Nevada. There have been few losses in California from volcanic eruptions. Mt. Lassen, an active volcano, is the southernmost volcano in the Cascade Range. There are numerous active volcanoes in the Cascades including Mount Shasta in California and several others in Oregon and Washington. Mount Lassen last erupted in the period between 1914 and 1921; this period of volcanic activity included steam and ash eruptions as well as a small lava flow. Like the other volcanoes in

the Cascades, Mount Lassen is considered dormant which means that it is not currently erupting but is expected to erupt again in the future. Mount Lassen has erupted at least seven times within the past 1,200 years.

The Sutter Buttes are volcanic in origin. According to the California Division of Mines and Geology, neither the Sutter Buttes nor Sutter County are identified as being located in an area of "Potential Volcanic Hazard." The Buttes erupted between 1.60 and 1.35 million years ago. During their eruption, melted rock, or magma pushed its way upward beneath the flat valley layers of sandstone, shale, gravel beds, and marine deposits. The magma solidified into large lava domes of the Castellated Core of the Buttes. The first few of these volcanic necks formed a light-colored rock called rhyolite. Later, more voluminous, extrusions cooled into a dark colored rock called andesite. Most of the large, high crags, such as South Butte, North Butte, West Butte, and Twin Peaks, are examples of andesite domes. While the magma intruded, they forcefully uplifted, stretched, and cracked the preexisting sedimentary layers, first arching them into a high dome. Later the sediments were eroded away, leaving only tiny remnants in the Castellated Core. As the lava domes breached the surface, they released great volumes of hot, pressurized volcanic gases and steam with explosive force. When the volcano quieted down, the long process of erosion began to carve away the softer materials of the volcano.



SUTTER COUNTY

EXPANSIVE SOILS



0 10000 20000
SCALE IN FEET

prepared by the
SUTTER COUNTY COMMUNITY SERVICES DEPARTMENT

LEGEND



Moderate
Oswald-Gridley-Subaco: Moderately deep, level to nearly level, poorly drained and moderately well drained clay and clay loam; in basins and on basin rims



High
Clear Lake-Capay: Deep and very deep, level to nearly level, poorly drained and moderately well drained clay and silty clay; in basins and on basin rims

Figure 10.3-1
Expansive Soils

There are four main hazards that may accompany volcanic eruptions: 1) ash and cinder falls, 2) explosive blasts, 3) lava flows, and 4) mud flows. Despite the general severity of volcanic hazards, potential volcanic hazards for Sutter County are unlikely. In historic times there are no records of significant ash falls, explosive effects, lava flows or mud flows in Sutter County. Further, impending volcanic eruptions generally give numerous advance warning signs and thus it is usually possible to evacuate residents in areas subject to volcanic hazards.

10.4 STRUCTURAL HAZARDS AND CRITICAL FACILITIES

The majority of buildings in the unincorporated areas of Sutter County are one and two story wood frame structures, used principally as single family dwellings. Sutter County does not have any real concentration of buildings other than a few older downtown locations within Yuba City and Live Oak. The Board of Supervisors is responsible for adopting codes and standards for the construction, repair, or alteration of structures. Sutter County's Building Inspection Program is the agency responsible for enforcing such building regulations in the unincorporated areas. The cities of Yuba City and Live Oak have their own building inspection departments.

Critical facilities are generally defined as those providing important health and safety functions (e.g., hospitals, fire stations, etc.), having large numbers of occupants (office buildings, etc.), engaged in large scale industrial processes (manufacturing plants, mills, etc.), providing large numbers of people with critical services (electricity, gas, water, waste water, etc.), involved with the manufacturing, use, storage or distribution of toxic and hazardous materials (refineries, petrochemical plants, warehouses, etc.), having a network character upon which the community depends heavily (highways, important main roads, bridges, etc.), and those whose failure threatens large numbers of people in the nearby and surrounding areas (dams, nuclear power plants, etc.).

The earthquake performance of structures varies considerably due to a number of factors. These include their location across active faults or in poor ground areas (landslide, liquefaction, etc.) type of construction (wood frame, unreinforced masonry, nonductile concrete frame, etc.), magnitude and intensity of the earthquake and duration of strong ground shaking, distance from the causative faults, and similar factors. During recent history, Sutter County has not experienced any damaging earthquakes; however, the buildings most vulnerable to damage are unreinforced masonry buildings.

In general, evidence from past earthquakes in this state shows that wood frame structures properly tied to their foundations perform very well, or if badly damaged cause few injuries and life loss even if located in poor ground areas. Older wood frame structures that have stone, brick, or cripple wall foundations, or that are not bolted to their foundations, do not perform well. Unreinforced masonry structures, on the other hand perform poorly under almost all earthquake conditions, and especially if located on poor ground areas. Nearby relatively small earthquakes can be very damaging because of the sharp motions generated by them. Distant events, while more damaging to taller buildings, can also damage unreinforced masonry buildings because of the stresses caused by long period motions. Mobile homes generally perform very well because of their lightness, but failures of their weak foundation supports (usually flimsy metal stands, concrete blocks etc.) can produce serious damage and economic losses. Older mobile homes are also considered serious fire hazards because of the non-fire resistant wall paneling and other materials. The performance of other structures depends on their specific characteristics, quality of construction, and other factors discussed above.

10.5 FIRE HAZARDS

The predominant land use in Sutter County is agricultural. Such uses typically minimize fire hazard potential since these lands are regularly irrigated and maintained. The Sutter Buttes are the primary concern when considering wild land fire hazards. This is due primarily to the limited access, steep terrain and remote location. The "river bottoms" or those areas along the Sacramento, Feather and Bear Rivers within the levee system are also susceptible to wild fires since much of the area inside the levees are left in a natural state, thereby allowing combustible fuels to accumulate over long periods of time. High use areas and those areas used illegally for camping are often the source of such fires. Neither the Sutter Buttes nor the river bottoms pose unreasonable fire risks to any rural community or urbanized area within Sutter County. This is confirmed by the County's consultations with the appropriate state agencies in which it was stated that there are no very high fire hazard areas in Sutter County. Wildfires in the Sutter Buttes are primarily extinguished by fire lines and back burning, with minimal reliance on water and chemical retardants. The typical first response to a wildfire in the Sutter Buttes consists of three (3) water tenders and six (6) Type 3 engines which supply 10,500 gallons of water. Based on past history and proposed land uses, this water supply has been, and will be, more than adequate. Water supply needs for river bottom fires are provided by water tenders or are pumped from the rivers. This source has historically been more than sufficient to extinguish river bottom fires. Peakload water requirements for residential uses in urban areas are 1,000 gallons per minute (gpm) plus the peak domestic consumption for the water purveyor. The peakload water requirements for commercial and industrial uses are determined on a case-by-case basis pursuant to the Uniform Fire Code. Minimum fire flows in residential areas outside the urban areas are established by the appropriate fire agency and the Uniform Fire Code.

Geologic hazards, to the extent that they exist, flooding and fire hazards may necessitate the need for planned evacuation in order to move people from a specific hazardous event. It is not possible to know with certainty how many people will actually need to be evacuated from any given crisis situation. The specific location and type of event will determine which evacuation plan will be implemented by the County. The County's Multi Hazard Plan designates planned evacuation routes. This document can also be used in case of fire or geologic events in the urban area. Generally, North Butte, South Butte, East Butte, West Butte, Pass, Pennington and Butte House Roads and Highway 20 will be used as evacuation routes for fires or geologic events in the Sutter Buttes. Garden Highway and Highways 20, 70 and 99 will be used as the primary evacuation routes for fires or geologic events in the river bottoms. All County roads have adequate structure and width to accommodate fire apparatus. The County's road and driveway standards provide at least the minimum, if not more than, acceptable standards for fire access. The County's Uniform Fire Code establishes the minimum vegetation clearance standards around all structures.

Fire hazards related to urban development can be expected to continue to increase in numbers commensurate with the increase in population of the urban area. Residential development outside the urban area can fragment and degrade fire protection services by introducing urban influences into the rural areas. These rural areas often have limited equipment and only volunteer personnel.

10.6 EMERGENCY RESPONSE

Sutter County does not maintain a separate Office of Emergency Services (OES) or Civil Disaster Office (CDO). The Sutter County Community Services Department, Fire and Emergency Services Program, performs the following duties: coordination of interagency and intergovernmental comprehensive emergency management planning, operations, and disaster assistance claims management for the County.

10.7 FLOOD HAZARDS AND DAM SAFETY

FLOOD HAZARDS

The majority of Sutter County lies on an alluvial plain between the Sacramento and Feather Rivers. The southeastern portion of the County is another alluvial plain located south of the Bear River and east of the Feather River. This area is subject to flows from the Auburn Ravine and other flood waters generated east of Sutter County. Such alluvial plains were geologically formed by water running over the stream banks during naturally reoccurring floods. Although these areas are protected to varying degrees by levee systems, the protection provided is no better than the integrity of the levee system and the degree of maintenance it receives. Sutter County has experienced frequent floods in the past. Severe flooding in 1955, 1958, 1964, 1982-83, 1986 and 1995 primarily resulted in the loss or damage to property and agricultural crops. Historically damaging floods were the result of failures of the levee systems rather than the levees being overtopped (please also see Section 5.6 DRAINAGE AND FLOOD CONTROL).

Portions of the levee system along the Sacramento, Yuba and Feather Rivers have been determined to be deficient in structural integrity and amount of freeboard provided. According to the SACRAMENTO RIVER FLOOD CONTROL SYSTEM EVALUATION Initial Appraisal Report - Marysville/Yuba City Area prepared in January of 1990 by the Army Corps of Engineers, the levee system contains a number of structurally deficient segments that are susceptible to seepage problems and do not provide the design levels of flood protection. Without the remedial repairs recommended in the report cited above, the levels of flood protection are well below the 100 year recurrence interval that the system was designed to provide. Since levee failures can be rapid blowouts, reasonable flood warning and evacuation would be difficult. As a result, loss of human life could occur under the existing conditions of the levee system. The U.S. Army Corps of Engineers is in the process of reconstruction efforts along the most critical areas of the levee system. Table 10.7-1 depicts the different segments of the rivers and their level of protection with and without the recommended remedial repairs.

In response to the threat of flooding due to levee failure or overtopping, Sutter County has developed the Slow Rise Flood Threat Plan. This plan establishes specific criteria for determining varying degrees of risk and appropriate courses of action based on the Feather River flow level measured from the 5th Street Bridge. Incremental increases in flow result in different stages being declared with the appropriate courses of action identified and pursued.

TABLE 10.7-1

**LEVELS OF LEVEE PROTECTION ^{1/}
WITH AND WITHOUT REMEDIAL REPAIRS**

Levee Reach	Without Remedial Repairs		With ^{2/} Remedial Repairs	
	Peak Flow (cfs)	Recurrence Interval (years)	Peak Flow (cfs)	Recurrence Interval (years)
Feather River				
upstream Honcut Creek	150,000	50	190,000	200+
between Honcut Creek and Jack Slough	155,000-			
	165,000	50	200,000	175+
between Jack Slough and Yuba River	-	60	-	150+
between Yuba River and Bear River	268,000	70	292,000	150+
between Bear River and Sutter Bypass	285,000	65	-	150+
Yuba River				
upstream of mouth	111,000	30	135,000	100
Bear River				
upstream from mouth	-	65	-	100+
Sutter Bypass				
between Tisdale Bypass and Feather River	178,000	20	-	150+

^{1/} Recurrence intervals are based on the assumption that no levee breaches occur upstream. In reality, if a levee break occurred upstream, downstream levee reaches would have a higher level of flood protection than those shown above.

^{2/} Levels of flood protection with remedial repairs are based on a minimum of 3 feet freeboard in a specified levee reach.

DAM SAFETY

There is currently only one dam located within Sutter County which is under the jurisdiction of the California Department of Water Resources' Division of Safety of Dams (DSD). The Steidlmayer #3 dam is located in the northwest interior of the Sutter Buttes. It is relatively small in size and any failure of this dam would result in minimal property damage. There are, however, 10 larger dams outside the county that have the potential to cause significant flooding in Sutter County if any were to fail. These dams are all under the jurisdiction of the DSD. Table 10.7-2 depicts each.

These dams have been designed and constructed for a variety of purposes with a wide range of capacities. The reservoirs are managed with a measure of flood control capability that is constantly weighed against the need for water storage for agricultural irrigation and domestic use.

TABLE 10.7-2

**DAMS UNDER STATE JURISDICTION
WITH POTENTIAL TO FLOOD SUTTER COUNTY**

<u>Dam Name</u>	<u>Owner</u>	<u>Stream</u>	<u>Type</u>	<u>Capacity Acre Feet</u>
Oroville Dam	State DWR	Feather River	Earth	3,537,577
New Bullards Bar	Yuba County Water Agency	Yuba River	Variable Radius Arch	969,600
Camp Far West Dam	South Sutter Water District	Bear River	Earth and Rock	103,000
Lake Almanor	Pacific Gas & Electric	North Fork Feather River	Hydraulic Fill	1,308,000
Thermalito Afterbay Dam	State DWR	Feather River	Earth	57,041
Thermalito Forebay Dam	State DWR	Feather River	Earth	11,768
Shasta Dam	US Bureau of Reclamation	Sacramento River	Gravity	4,552,000
Whiskeytown Dam	US Bureau of Reclamation	Clear Creek (Sac. Riv.)	Gravity	241,100
Folsom Dam	US Bureau of Reclamation	American River	Gravity	1,010,000
Englebright Dam	Corps of Engineers	Yuba River Radius Arch	Variable	70,000

10.8 SOLID AND HAZARDOUS WASTE MANAGEMENT

SOLID WASTE MANAGEMENT

In response to an increasing demand being placed upon landfill resources and recently adopted legislation by the State of California, local jurisdictions have prepared management plans for solid waste disposal, management and reduction. The cities of Yuba City, Live Oak, Marysville and Wheatland along with Yuba and Sutter Counties entered into a Joint Powers Agreement (JPA) in 1990 to form the Regional Waste Management Authority (RWMA). The City of Gridley, in Butte County, joined the RWMA in 1994. This is the only multi-county solid waste planning agency in the State of California. The JPA vests the RWMA with the power to prepare the Regional Agency Integrated Waste Management Plan. The Plan is comprised of the Source Reduction and Recycling Element (SRRE), the Household Hazardous Waste Element (HHWE), the Non-Disposal Facilities Element (NDFE), the Siting Element, and the Regional Agency Integrated Waste Management Summary Plan. This plan is considered locally approved and expected to be approved by the state in 1996.

Within the Bi-County area, there are no existing, permitted solid waste disposal facilities in the cities of Live Oak, Wheatland and Yuba City, or within the unincorporated area of Sutter County. Solid waste from the bi-county jurisdictions is collected by Yuba-Sutter Disposal, Inc. (YSDI) under franchise contract agreements and is disposed of at the YSDI Landfill, located in Marysville. Selected loads of solid waste from these jurisdictions are processed through the YSDI Integrated Waste Recovery Facility (IWRf), located adjacent to the landfill in Marysville. Recyclable solid wastes are separated from the solid waste loads, the residual waste is disposed of at a YSDI landfill.

Solid waste collection is not required in Yuba City, Live Oak or unincorporated Sutter County.

The YSDI landfill has a remaining site capacity of approximately two to three years. YSDI received approval for a new landfill site located on Ostrum Road also in Yuba County that will provide landfill capacity for 45 to 50 years. (For additional information regarding solid waste disposal please refer to Section 5.7.)

HAZARDOUS WASTE MANAGEMENT

The Department of Health Services defines hazardous waste in the following manner:

A waste, or combination of wastes, which because of its quantity, concentration, physical, chemical, or infectious characteristics, may either:

1. Cause, or significantly contribute to an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness; or
2. Pose a substantial present or potential hazard to human health or environment when improperly treated, stored, transported or disposed of, or otherwise managed.

According to Sutter County's Hazardous Waste Management Plan (HWMP) completed in January 1990, the County's hazardous waste production is about 2,500 tons per year. Wastes managed on-site are not included in this figure, however, the figure does include manifested one-time cleanup wastes. Waste oil is the largest volume of waste produced, accounting for some 71% of the quantifiable waste stream with Small Quantity Generators (SQG's) generating most of the oil.

Sutter County relies on State enforcement of hazardous waste regulations, but certain programs exist at County and City levels regarding hazardous materials storage and emergency response procedures. Additional requirements based on changing state law have increased the work load on several local departments. In most cases meeting these new requirements has proved to be a challenge due to limited financial and staff resources. Federal, state and local agencies maintain a variety of periodically updated information with regard to hazardous waste handling, contaminated sites, hazardous materials storage and emergency response. Below is a list of public agencies and areas of responsibility with respect to hazardous waste/material (it should be noted that hazardous waste regulations and areas of responsibility are constantly evolving which often result in a shift of responsibility between agencies):

- Central Valley Regional Water Quality Control Board - Toxic Pits, Underground Tank Tracking System.
- City of Yuba City - Regulates industrial discharges into municipal sewage system.
- Feather River Air Quality Management District - Enforces State and Federal Outdoor Air Quality regulations.
- Department of Health Services - Abandoned Site Program Information System Facility Profile Report and Medical Waste Management Program.
- Cal EPA, Department of Toxic Substances Control - Preliminary Assessment/Site Investigation sites (ASPIS List); the Annual Report on Active Site Cleanups.
- City of Live Oak - Regulates industrial discharges into municipal sewage system.
- Sutter County Agriculture Department - Underground Storage Tanks (USTs) and Proposition 65.
- State of California Environmental Affairs Agency - Hazardous Waste and Substances Site List.
- Sutter County Community Services Department, Environmental Health Program - Proposition 65 (Toxics and Safe Drinking Water Initiative) reports.
- Sutter County Community Services Department, Office of Emergency Services Program - Partial inventory of business and property owners having threshold quantities of hazardous materials (above ground); Hazardous Materials Emergency Response Plan.

- Governor's Office of Planning and Research - Hazardous Waste and Substances Site List (quarterly).
- U.S. EPA, Region IX - U.S. Superfund Sites, National Priority List

Yuba Sutter Disposal, Inc. operates a Household Hazardous Waste Collection Facility on Burns Drive in Yuba City which is utilized by bi-county residents to dispose of household hazardous waste and also available for use by Small Quantity Commercial Source Generators. Most of the 2,500 tons of hazardous wastes generated annually in Sutter County is shipped out of the County for disposal or treatment. In FY 1994/95, approximately 73 tons of household hazardous waste was disposed of at this facility.

The County does not have any Class I landfill disposal or treatment facilities. The Sutter County Hazardous Waste Management Plan identified that the current amount of hazardous wastes produced in the County cannot economically support the development of a Class I facility within Sutter County. The Plan proposes that Sutter County will cooperate with other counties in the north central region of California to develop regional facilities for the management of hazardous wastes.

10.9 AIRPORT SAFETY

Air transportation in Sutter County utilizes 1 public, 1 special use, 6 private and 3 restricted (not open to public available for emergency use) airports serving both general and agricultural users. Other airstrips and heliports are located throughout the County and are either used as private use air strips or airstrips for agricultural users. Only 1 facility provides public access, and state law requires that facility to develop a Comprehensive Airport Land Use Plan, designating airport vicinity land use and clear zones. The Airport Land Use Commission (ALUC) in each county adopts these plans (Sacramento Area Council of Governments functions as the ALUC for Sutter County). The goal of each ALUC is to attain compatible land uses surrounding airports. However, the ALUCs are without jurisdiction to alter previously developed lands in order to avoid uses that are incompatible with airport uses.

SUTTER COUNTY AIRPORT

The Sutter County Airport is located on approximately 170 acres of land, and is operated by the Sutter County Public Works Department. No commuter airlines utilize the Sutter County airport. Due to Sutter County's proximity and convenience to the Sacramento International Airport directly south of Sutter County, commercial service has not expanded into Sutter County.

The airport has a single paved runway 3,040 feet in length and 75 feet wide. No control tower is located at this airport. A major portion of the airport operations are a result of agricultural aircraft involved in crop dusting activities. The County adopted a master plan for airport operations in 1968.

The airport has a Comprehensive Land Use Plan (CLUP) which establishes height, noise and safety planning boundaries for the airport and defines compatible land uses. The Sutter County Airport is located on an island of unincorporated Sutter County land, surrounded to the north, south, and west by land incorporated by Yuba City. The primary land use to the north and west of the airport consists of low to medium density residential, with some commercial and industrial use. The Yuba-Sutter Fairgrounds is also located to the north. The Richland Housing Center, a Sutter County Housing Authority project, is located west of the airport. South of the airport is largely vacant at present, and is predominantly zoned for industrial use. Land further south is zoned for residential use. Much of the land immediately surrounding the airport itself is owned by the airport, and is zoned for industrial use. Land to the east between the airport and the Feather River is a flood plain area.

TABLE 10.9-1

**TOTAL OPERATIONS
Sutter County Airport**

Year	Total Operations
1990	58,000

Source: Draft CLUP, June 1993

10.10 RADON

Radon is a colorless, odorless, radioactive gas. It comes from the natural decay of uranium that is found in nearly all soils. It typically moves through the ground to the air above and into homes and other buildings through cracks and openings in the foundation. Any home, school or workplace may have a radon problem regardless of whether it is new or old, well-sealed or drafty, or with or without a basement. Nearly one out of every 15 homes in the United States is estimated to have elevated annual average levels of indoor radon.

A driving force (reduced atmospheric pressure in the house relative to the soil, producing a pressure gradient) and entry points must exist for radon to enter a building from the soil. The negative pressure caused by furnace combustion, ventilation devices, and the stack effect (the rising and escape of warm air from the upper floors of the building, causing a temperature and pressure gradient within the structure) during cold winter months are common driving forces. Cracks and other penetrations through building foundations, sump holes, and slab-to-foundation wall joints are common entry points.

Radon levels in the basement are generally higher than those on the main floor or upper floors of most structures. Homes with basements generally provide more entry points for radon, commonly have a more pronounced stack effect, and typically have lower air pressure relative to the surrounding soil than nonbasement homes. The term "nonbasement" applies to slab-on grade or crawl space construction.

The Great Valley is underlain by surficial materials of Quaternary alluvium derived largely from the Sierra Nevada to the east and the Coast Ranges to the west. Equivalent uranium values for rocks and soils in the Great Valley are influenced greatly by the uranium content of material supplied by the nearby mountains. The northernmost part of the Great Valley has eU values (estimated uranium from aerial radiometric survey) that generally range from 0.5 to 2.5 parts per million (ppm), except for the Sutter Buttes area which has values of as much as 5.5 ppm eU.

The Environmental Protection Agency (EPA) prepared a map of Radon Zones which assigns each of the 3,141 counties in the United States to one of three zones:

Zone 1 Counties - have a predicted average indoor screening level greater than 4 pCi/L (radon to air unit of measure, see glossary)

Zone 2 Counties - have a predicted average screening level greater than or equal to 2 pCi/L and less than or equal to 4 pCi/L

Zone 3 Counties - have a predicted average screening level less than 2 pCi/L

The EPA map of Radon Zones shows Sutter County in Zone 3. Zone designations were determined by assessing five factors that are known to be important indicators of radon potential: indoor radon measurements, geology, aerial radioactivity, soil parameters, and foundation types.

Elevated indoor radon can be expected in several geologic settings in California. Uraniferous granites, uraniferous Tertiary silicic volcanic and sedimentary rocks, uraniferous dark marine shales, and residual soils and alluvium derived from these units are likely to result in significant percentages of homes with indoor radon levels exceeding 4 pCi/L. The most likely areas for such rock formations to occur are those where elevated eU values occur in the aeroradiometric data. Where structures are sited on excessively drained soils or steep slopes, the radon potential is higher. Extreme indoor radon levels (greater than 100 pCi/L) may be expected where structures are inadvertently sited on uranium occurrences. In those areas where the eU values are moderate to low, excessively well-drained soils or soils with unusually high emanating power may locally cause some indoor radon levels to exceed 4 pCi/L. The presence of steep slopes may also influence radon potential because, in many cases, the structure is built partly below grade. The below-grade parts of the house are more likely to draw soil-gas radon indoors. Where the slope is accommodated by placing the structure on stilts rather than cutting into the hillslope, the radon potential of the structure is low.

Because of the complex nature of radon reduction methods, and because the method used in any given home will depend on details of the construction of that home, advice on specific reduction methods is not described herein. It is best to evaluate the need for reducing radon in your home before you decide on the details of how it can best be accomplished. The Environmental Protection Agency produced a booklet entitled Radon Reduction Techniques for Detached Houses. That booklet will provide suggestion of reduction methods based on your particular home construction.

10.11 FINDINGS

Seismic Hazards

- Sutter County is not in an area of active earthquake faults or recent seismic activity.
- Potential earthquakes on active regional faults could cause moderate seismic shaking in Sutter County causing damage in the County.
- A series of small potentially active faults are located within the Sutter Buttes.
- Portions of the County paralleling the rivers have a generally high potential for liquefaction or amplification of ground motion during a major earthquake.

Geologic Hazards

- The identification and assessment of geologic hazards is in the public interest.
- Geologic hazards limit land development capabilities.
- Erosion of surface materials depends on slope, soil, vegetation, precipitation and development.
- High water levels during flooding can cause significant erosion and other problems for valley farming areas.
- Subsidence of ground surfaces can cause damage in areas where there are extensive withdrawals of groundwater and gas.
- Landslide hazards depend on slope, soil, bedrock, vegetation, precipitation, and proximity to areas undergoing rapid erosion.
- Basins and basin rims in the County in which the soils contain large amounts of clay may result in structural damage from soil shrinking and swelling with changes in moisture content.

Structural Hazards and Critical Facilities

- The County is subject to several hazard types that could affect public safety to varying degrees. These include flooding, structural and wildland fires, potential fault movement, earthquake induced ground shaking and expansive soils.
- As development increases, greater demands will be placed on the County's Community Services Department, Building Inspection Program for the full range of permit, plan review, and construction inspection activities.
- The County adopts the latest recommended versions of various codes governing structural safety and maintains a Building Inspection Program to assure the code requirements are met.
- The cities of Yuba City and Live Oak maintain their own building inspection departments.
- Other agencies outside of the County have major influences on the safety of selected structures and buildings in Sutter County. These include the State's Office of the State Architect (for public schools), Office of Statewide Health Planning and Development (for hospitals), the Department of Water Resources for some flood control projects, and others. Some federal agencies, especially the Corps of Engineers (for flood control projects), General Services Administration (for federal buildings), and others share the responsibility for structural safety in Sutter County.

Fire Hazards

- The Sutter Buttes and the "riverbottoms" are susceptible to wildland fires, however, neither pose unreasonable fire risks to any rural community or urbanized area within Sutter County.
- Growth in the urban area will not necessarily result in "new" fire hazards but most likely an increase in the demand on existing fire protection services.
- Residential development outside the urban area has the potential to degrade fire protection services.
- Based on consultations with the State Office of Emergency Services and the California Department of Forestry and Fire Protection, neither the Sutter Buttes, nor the river bottoms pose an unreasonable risk from wildland or urban fires.

Flood Hazards

- Sutter County is located between the Sacramento River and the Feather River and is bisected by the Sutter Bypass.
- Sutter County has experienced flooding that has resulted in loss of property and crops.

- There are 10 large dams on various rivers within Northern California that have the potential to cause significant flooding in Sutter County if any were to fail.
- Most of Sutter County is at risk from flooding should levee and flood control systems fail. Measures outlined in the County's Dam Evacuation Plan, Slow Rise Flood Threat Plan, and applicable sections of the Sutter County Emergency Response Plan will be applied to address various flood related episodes.

Airport Safety

- The Board of Supervisors has adopted a master plan for the County's public airport operations.
- The Board of Supervisors has considered safety for the County's public airport and has a plan and facility commensurate with their current types of aircraft and numbers of aircraft operations.
- Airports serving only agricultural uses are exempt from regulation by the Airport Land Use Commission. These airports may have significant operations and should be considered when reviewing development proposals.

Hazardous Waste Management

- With the additional burden on County Government due to new and changing regulations in Hazardous Waste, Hazardous Materials and Emergency Response, current financial and human resources are inadequate to deal with all of the requirements associated with these programs.

Radon

- With the exception of the Sutter Buttes, Sutter County has low levels of radon.

10.12 PERSONS CONSULTED

Boyer, Bob. Sutter County Building Inspection Department

Boyer, David. Sacramento Area Council of Governments

Engle, Christa. California Department of Transportation, Office of Local Planning

Hart, Tom. Sutter County Public Works Department

Kraus, Gary, Fire Services Administrator. Sutter County Office of Emergency Services

Martin, Keith. Regional Waste Management Authority

Michael, Jim. California Department of Transportation, Division of Aeronautics

Mussallam, George. Sutter County Public Works Department

Toor, Surjit. Soil Conservation Service

10.13 GLOSSARY

Aerial radiometric, aeroradiometric survey: a survey of radioactivity, usually gamma rays, taken by an aircraft carrying a gamma-ray spectrometer pointed at the ground surface

Braccia: a fairly indurated (hard, cemented) volcanic rock consisting of coarse angular ejects within a fine tuff matrix

Ci/L (picocuries per liter): a unit of measure of radioactivity used to describe radon concentrations in a volume of air. One picocurie (10^{-12} curies) is equal to about 2.2 disintegrations of radon atoms per minute. A liter is about 1.06 quarts. The average concentration of radon in United States homes measured to date is between 1 and 2 pCi/L

Holocene: about the last 11,000 years

ppm (parts per million): a unit of measure of concentration by weight of an element in a substance, in this case, soil or rock. One ppm of uranium contained in a ton of rock corresponds to about 0.03 ounces of uranium. The average concentration of uranium in soils in the United States is between 1 and 2 ppm

Quaternary: a period of geologic age within the last 1.6 million years

Tuff: a rock comprised of compacted volcanic fragments

Volcanic Rocks: igneous rocks extruded or deposited on the surface of the earth

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CHAPTER 11

ENERGY

11.1 INTRODUCTION

The first part of this chapter provides an overview of the energy trends and forecasts at the state level and in Sutter County. The remaining sections focus on the existing and potential types of energy production.

11.2 STATE TRENDS

The California Energy Commission (CEC) is responsible for establishing Statewide energy policies which guide energy development, distribution and conservation. In carrying out this function, the CEC determines the probable demand for various energy sources and develops programs to assure the efficient delivery of energy resources to the consumer, at a reasonable price.

Despite the wide array of energy options in California, oil and natural gas provide up to 85 percent of the State's energy. California consumes an average of two million barrels of oil and five billion cubic feet of natural gas each day. Of this, California produces 50 percent of the oil and 20 percent of the natural gas, importing the rest. While domestic supplies of natural gas are expected to remain adequate, current sources of oil are expected to diminish over the next 20 years, forcing California to import increasing amounts of oil to make up the difference.

Hydropower, nuclear, geothermal, solar, wind, and waste to energy resources, most of which are converted to electricity, constitute about 12 percent of the State's energy supplies. The remaining three (3) percent comes from coal.

11.3 LOCAL TRENDS

Pacific Gas and Electric (PG&E) is a publicly held utility which provides electric and gas service to Sutter County. Since 1988 there has been a steady increase in electric energy use, while over the same period natural gas use has fluctuated somewhat, with a slight decrease in consumption. Table 11.3-1 shows the electricity and gas consumed by sector in Sutter County between 1988 and 1992. As the population of the County increases the demand for these energy sources will also increase.

**TABLE 11.3-1
ELECTRIC AND GAS CONSUMPTION**

Electric KWH	1990	1991	1992	1993	1994	1995
Residential	191,661,344	194,811,296	204,088,192	201,956,237	207,349,116	204,443,994
Commercial	115,325,712	121,478,832	121,012,896	126,387,512	134,183,817	144,481,742
TCU	17,392,272	16,427,039	16,492,327	25,693,269	8,112,396	17,424,763
Assembly Industry	10,536,652	8,213,620	8,994,338	9,333,412	10,362,156	9,571,152
Process Industry	23,012,464	24,597,952	24,020,464	23,108,153	24,683,487	25,396,437
Mining & Construction	1,535,391	1,428,499	1,196,370	1,026,204	959,687	794,132
Ag. & Water Pump	62,053,840	61,966,416	64,071,200	53,105,031	65,799,925	47,546,529
Unclassified	13,898,626	16,377,711	27,435,296	30,247,161	27,117,216	25,481,075
Total	435,416,301	445,301,365	467,311,083	470,856,979	478,567,800	475,139,824
Gas THERMS						
Residential	11,812,900	12,225,395	11,362,070	12,703,860	13,053,754	11,951,686
Commercial	5,180,467	4,723,158	4,660,192	4,088,723	5,071,889	5,005,262
TCU	63,087	82,005	78,687	98,146	99,083	83,259
Assembly Industry	94,207	103,899	162,163	140,571	163,852	170,766
Process Industry	3,987,829	4,733,668	4,564,253	2,131,582	3,423,550	4,430,212
Mining & Construction	25,391	19,553	14,789	13,661	13,665	11,759
Ag. & Water Pump	1,025,886	378,190	134,198	88,420	140,752	144,424
Unclassified	458,505	7,806,957	1,145,691	708,028	2,834,777	1,295,872
Total	22,648,272	30,072,825	22,122,043	19,972,991	24,801,322	23,093,240

Source: California Energy Commission, Quarterly Fuel and Energy Report Database

11.4 FUTURE ENERGY OPTIONS

Future energy demand is difficult to pinpoint due to a variety of factors including fluctuations in business cycles, the overall rate of economic growth in the state, technological advances in the efficient use of energy, and improved conservation practices. All these factors affect the pricing of energy supplies and the feasibility of new energy source development.

The CEC develops energy demand forecasts for various energy sources, however, they are of little use for general plan purposes because they cover very large planning areas and do not provide county-specific information. In addition, the forecasts are based on economic demand and are subject to significant fluctuations.

Based on discussions with PG&E officials, current gas and electricity supplies are expected to meet demands in Sutter County for the foreseeable future.

An option to augment existing electric power sources is cogeneration, and possibly waste to energy development, which is considered a subset of cogeneration. This resource has been utilized to a limited degree in Sutter County.

Another feasible energy option, based on the County's climate, is solar energy. However, present technology has not reached the level of economic feasibility needed to stimulate new facility development.

Other energy types such as wind, geothermal, and oil production are not expected to occur at any significant levels. However, significant natural gas production is expected to continue in the County.

Existing, proposed, and future potential development is described for each energy resource in the following sections. In addition, environmental issues and regulatory requirements particular to each energy type are discussed.

11.5 TRANSMISSION LINES AND SUBSTATIONS

EXISTING FACILITIES/EXPANSION POTENTIAL

Electricity purchased from PG&E by local customers is generated and transmitted to the County by a large network of power plants and transmission lines located throughout California. Sutter County is presently crossed and served by two general types of transmission lines. The first type is the 500 kV transmission line that is a part of the Pacific Intertie.

The purpose of this line is to enhance service reliability throughout the western states. The second type is the 60 kV - 230 kV transmission lines that serve the specific energy needs in the County. Transmission and substation facilities located in the County are shown in Figure 11.5-1.

SUTTER COUNTY

TRANSMISSION LINES and SUBSTATIONS



0 10000 20000
SCALE IN FEET

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LEGEND

- 500 KV transmission line
- 230 KV transmission line
- 115 KV transmission line
- 60 KV transmission line
- Substation

Figure 11.5-1
Transmission Lines and Substations

REGULATORY ENVIRONMENT

The siting of new transmission lines is regulated by the Public Utilities Commission. Currently, there are no designated transmission line corridors in the County. Any new transmission facilities would need to be evaluated on a case by case basis.

FUTURE DEVELOPMENT

According to PG&E, there is no immediate need for new transmission lines or substations in the County. Future development of these facilities will be demand driven, based on the location, type and number of new electricity users in the County.

11.6 COGENERATION

EXISTING FACILITIES/EXPANSION POTENTIAL

Cogeneration is an old and proven technology recently revived by the need to conserve energy resources and to achieve energy self-sufficiency through the use of alternative technologies. Electricity can be produced through cogeneration of waste heat in business, industry, and governmental facilities, thus saving money and conserving energy.

Cogeneration can be defined as simultaneous production of electrical or mechanical energy and thermal energy. There are many types of cogeneration systems, including dual-purpose powerplants, some waste heat use systems, certain types of district heating systems, space heating and cooling in municipal and commercial applications, and total energy systems. By recapturing and using some of the thermal energy that is normally discharged in the industrial process, cogeneration can reduce system fuel requirements by one to 30 percent (CEC 1982).

Industrial uses offer the greatest potential fuel savings through cogeneration. Industry often uses process steam in applications requiring low temperature heat (less than 400 degrees Fahrenheit), but generates steam through direct combustion of fossil fuels with resulting temperatures of over 3,000 degrees Fahrenheit. By using this high-temperature combustion heat to generate electricity, and then using the normally wasted exhaust heat for the industrial process, substantial fuel savings can be realized.

In addition, an industrial consumer's energy vulnerability can be reduced through cogeneration by providing improved efficiency, greater control, and increased reliability of service. Cogenerated electricity can either be sold to PG&E or used to reduce site demand and energy charges.

There are four existing cogeneration facilities in Sutter County, Greenleaf 1 and 2 owned by LFC Systems, a plant owned by Yuba City Cogeneration, and a plant that is owned by the Yuba City Racquet Club. All four facilities are fueled by natural gas, support an industrial or commercial user, and generate surplus electricity. The surplus electricity generated from all four plants is purchased by PG&E.

The Greenleaf 2 plant and the Yuba City Cogeneration plant are located adjacent to the Sunsweet food processing plant in Yuba City. Combined, these two plants generate approximately 99,500 kilowatts (kW) of power, 49,500 kW and 49,000 kW respectively. Steam is generated at both facilities which support the food processing operations at the Sunsweet Plant. Greenleaf 2 runs year round while the Yuba City plant runs only during the summer months.

The Greenleaf 1 Plant is located on Township Road. This plant generates 49,500 kW, and in addition to steam generation, the plant also generates heat which is used to dry wood products.

The Yuba City Racquet Club, located on Jones Road, has a small cogeneration facility that generates 60 kilowatts (kW) of power.

A contract for 800 kW was executed between Knights Landing/Sutter County and Henwood Associates on February 26, 1985. However, this plant was not yet in operation as of 1995.

REGULATORY ENVIRONMENT

Cogeneration projects are subject to many of the federal, state and local regulations affecting industrial facilities as well as other regulations pertaining specifically to electricity generation. The CEC is authorized by the Warren-Alquist Act of 1975 to regulate the siting of all thermal power plants larger than 50,000 kW, including cogeneration plants. The County also has regulatory power over cogeneration facilities to ensure compliance with local general plan and zoning provisions. For projects under 50,000 kW, the County would be the lead agency and would conduct the environmental review required under CEQA.

There are numerous other federal and state regulations which establish cogeneration requirements regarding fuel use (Federal Fuel Use Act - FUA, and Natural Gas Policy Act - NGPA), power exchanges (Public Utility Regulatory Policies Act - PURPA), environmental quality, financing and ownership, and health and safety.

FUTURE DEVELOPMENT

Public policy advantages, specifically the reduction in dependence on expensive and vulnerable supplies of foreign oil, can result through continued development of cogeneration facilities. For this reason, legislation has reduced barriers to cogeneration, thus enhancing the economic attractiveness of this type of energy technology. However, favorable utility rates for purchases of excess cogenerated power have recently been removed, thereby reducing the incentives for future cogeneration development.

11.7 WASTE TO ENERGY

Waste to Energy (WTE) plants have received renewed interest in recent years due to the need for diversified energy development. There are currently 136 operational WTE energy facilities in California, with an operational capacity of 1,279 megawatts (MW). WTE facilities were previously encouraged through energy tax credits and favorable buy-back rates. However, tax credits have been eliminated and there is a widespread concern over air emissions associated with the use of WTE materials for fuel.

WTE facilities are typically located near their primary fuel source to minimize the transportation of fuel to the conversion site. Another essential siting requirement is proximity to electrical transmission facilities with available capacity.

FACILITY CHARACTERISTICS

There are several types of WTE conversion processes including: biomass, digester gas, municipal solid waste, and landfill gas. WTE facilities are usually privately owned, and electricity produced is used in a cogeneration capacity (e.g., in a timber mill operation).

Biomass

This method uses conventional steam boilers to burn processed vegetative material, usually wood agricultural waste, or forest waste to produce energy and electricity.

Digester Gas

The gasification process involves the chemical treatment of biomass, human or animal waste, or other organic material to produce gas that can be burned to produce energy and electricity. Although this process results in a lower conversion efficiency, existing gas and oil fired boilers can be easily retrofitted to accommodate the gasification system. This type of WTE conversion would be suitable for special applications, particularly in remote areas where other forms of electrical power are not available.

Municipal Solid Waste

This process involves the collection and processing of locally collected garbage which is then burned to produce energy and electricity.

Landfill Gas

This process involves the collection of gas that is formed at landfills as garbage decomposes. The gas is collected and burned to produce energy and electricity.

REGULATORY ENVIRONMENT

The California Energy Commission (CEC) maintains jurisdiction over WTE facilities with generated capacity of 50 MW or greater. For projects less than 50 MW, the California Waste Management Board (CWMB) acts as an advisory agency and reviews all applications. The permit process for these smaller projects is handled by local agencies, such as the Sutter County Community Services Department and the Feather River Air Pollution Control District.

EXISTING AND PROPOSED FACILITIES

There are no known waste to energy plants, existing or proposed, in Sutter County at this time.

11.8 HYDROELECTRIC

FUTURE DEVELOPMENT POTENTIAL

There are no existing hydroelectric facilities in Sutter County. Due to the topography of the County and the location of major waterways, there is no potential for development of large scale hydroelectric facilities in the County.

11.9 NATURAL GAS, OIL, AND COAL ENERGY RESOURCES

NATURAL GAS RESOURCES

Sutter County has extensive natural gas resources located throughout the western portion of the County. The general location and names of the known gas fields in the County are depicted on Figure 9.5-1 in the Natural Resources Chapter.

In addition to local natural gas supplies, natural gas supplied to the County for customer use comes principally from two other sources: Texas and Canada. The natural gas is transported to and from Sutter County through a series of pipelines. Figure 11.9-1 depicts the general location of natural gas transmission facilities located in the County.

FUTURE DEVELOPMENT POTENTIAL

Future development potential of natural gas resources in Sutter County is anticipated to be good. Historically, Sutter County has produced between 12-16 million cubic feet (mm cf) of natural gas on an annual basis.

This represents nearly 5% (4.9%) of the total natural gas production in the State of California. The Grimes Natural Gas Field, which straddles the Colusa/Sutter County border is rated as the fourth largest natural gas field in California.

Annual gas production is driven primarily by price. Typically, when natural gas prices are higher, so to is the production.

REGULATORY ENVIRONMENT

Supplies of natural gas transported to and from the County are subject to California Public Utilities Commission (CPUC) and Department of Energy (DOE) regulation.

Natural gas wells within the County are subject to County siting and operational requirements.

EXISTING AND PROPOSED FACILITIES

Currently there are 252 permitted gas wells in Sutter County. Of these, 201 are production wells and 51 are temporarily shut down. Between November 1985 and November 1995 the County has permitted 237 natural gas wells. This equates to approximately 24 new wells on an annual basis over this period. Based on historical activity, it is likely that additional wells will be established at similar annual rates.

OIL AND COAL ENERGY RESOURCES

There are no existing oil or coal extraction processes in the County. The likelihood that these resources are present in the County is low. Therefore, future development of these resources in the County is not likely.

11.10 SOLAR

FUTURE DEVELOPMENT POTENTIAL

Sutter County has been identified as having a reasonable potential for solar energy development. The most common solar development is small scale residential use. Residential solar use is discussed in the Energy Conservation section of this chapter. In terms of commercial solar energy production, solar technology currently exists on a token scale in the County. Although there are presently no solar producing facilities or "solar farms" in the County, the following discussion addresses the potential for solar production in Sutter County.

Solar collection devices must be properly sited to receive incoming energy from the sun. Furthermore, a site with solar development must be protected from obstructions which block the collection function. Solar access refers to the unobstructed exposure to the sun that a solar collector requires to operate properly. Solar access can be a complicated issue because it deals with a number of variables. Among these variables, the most important are:

- 1) The constant change of the sun's position in the sky;
- 2) The tilt and orientation of the solar collection surface;

- 3) The existence or future development of structures adjacent to the solar collection surface which may interfere with solar collection; and
- 4) The presence and type of vegetation adjacent to the collector.

These variables are important in that they all have the potential to threaten the efficiency of energy collection. The solar collector must not be shadowed during the hours of peak collection. Two state laws exist which protect solar access rights. The Solar Shade Control Act prohibits the planting of any tree or shrub on property adjacent to a previously installed solar collector which would block the collector during 10:00 a.m. and 2:00 p.m.

The Solar Rights Act specifically recognizes the legality of easements for solar access between property owners; prohibits ordinances or covenants restricting the use of solar systems; and requires tentative subdivision maps to provide for solar access.

The two principal types of solar development are:

- 1) Solar-thermal processes, in which sunlight is collected and transformed into heat energy.
- 2) Photovoltaic processes, in which sunlight is directly converted into electrical energy.

Each of these processes can be used in a variety of applications. For example, solar-thermal and photovoltaic processes can be used for heating buildings or, under proper conditions, can generate steam to operate electrical generating boilers. Additionally, a solar energy production facility could be developed in a large open area to mass produce energy. Produced electricity could be tied into the local transmission lines to aid in serving the overall energy needs of the County.

Given Sutter County's climatic conditions, the technical potential for solar development is almost unlimited. New solar projects proposed in Sutter County are regulated by the California Energy Commission (CEC). Typically, the CEC reviews only projects over 50 MW.

SUTTER COUNTY

NATURAL
GAS LINES



0 10000 20000
SCALE IN FEET

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FIGURE 11.9-1
NATURAL GAS LINES

11.11 WIND

FUTURE DEVELOPMENT

Commercial wind energy is only effective in areas with strong and persistent winds. A minimum annual average wind speed of 10 to 12 miles per hour is needed for a productive site for wind generated energy. Sutter County has been identified as having a low potential for commercial wind generated energy.

Presently, no commercial wind generation facilities exist in the County. Wind energy is primarily used for operation of privately owned water pump windmills used in remote agricultural operations. A Wind Resource Assessment Study was established by the CEC in 1977. Wind Stations were placed in strategic locations within Sutter County to monitor wind potential. Based on the data collected from this study, the County has an average wind speed of approximately 8.5 miles per hour, and is known to have prolonged periods of little to no wind.

The County Community Services Department has regulatory authority over proposed wind projects on private lands. However, because of the low wind power potential in the County, commercial wind facilities are not likely to become a significant energy industry.

11.12 GEOTHERMAL

FUTURE DEVELOPMENT POTENTIAL

Geothermal energy is derived from natural heat contained in the earth. This energy is used for the purposes of generating electricity and heating space and water with the help of modern technology. The natural heat of geothermal resources has been used for decades to heat homes and water in California. Geothermal power has been identified as a major source of energy, and is expected to be a significant component of energy generation in the state. However, geothermal energy production in Sutter County is nonexistent. Presently no known geothermal resources exist in the County, and geothermal development is not expected in the future.

11.13 ENERGY CONSERVATION

INTRODUCTION

Sutter County can reduce the effects of conventional energy shortages in the local communities by reducing its dependence on conventional energy resources. A successful program to reduce consumption of conventional energy resources and increase the use of renewable resources will not only reduce the disruptions to community life as a result of energy shortages, but can also contribute to state and federal efforts to promote energy conservation.

Options for reducing local energy consumption are presented for the major energy consuming uses. Energy required for space and water heating, lighting, industrial processes, and transportation can be greatly diminished by reducing wasteful energy consumption practices and habits. Other common approaches to energy conservation are recycling materials and converting waste into energy.

ENERGY CONSUMPTION PATTERNS

To facilitate the assessment of local energy consumption patterns, it is useful to determine the types and purposes of energy consumption in Sutter County. The relative importance of each type of energy use in the County is indicated in the paragraphs below through a discussion of the general trend in energy use identified for the residential, commercial, industrial, and agricultural sectors.

Residential

There are various factors that influence the type and amount of energy consumed in a residential structure. The most important are: 1) the type of dwelling units; 2) the size of the structure; 3) the number of occupants and their habits; 4) the weather conditions and time of year; 5) the thermal integrity of the building (level of insulation and number and location of windows); 6) the number of appliances (e.g., washing machine, clothes dryer, swimming pools, etc.); and 7) the type of appliances (e.g., gas versus electric heaters and ranges).

Typically, the most important factors influencing residential energy consumption are the type of house (detached single-family or multi-family structure) and the number of major appliances. A single-family home requires more energy for space heating than a multi-family unit, due to its bigger size and the amount of heat loss through external walls. It also requires more energy for operation of major appliances as it usually houses more occupants.

Some residential energy needs can be fulfilled by either gas or electricity (e.g., space and hot water heating, cooking, and clothes drying) while others are most likely dependent on electricity (lighting, radio, television, etc.). Space heating is by far the most energy consuming activity in residential structures. Even in moderate climates such as in California, space heating can account for more than one-third of residential energy consumption. Hot water heating is the second most energy consuming activity in a residence. In general, residential space and water heating consumes more natural gas than electricity (Table 11.13-1).

Commercial

Compared to residential uses, commercial activities consume more electricity than natural gas. Generally the major use of electricity for all commercial buildings is for lighting, with air-conditioning as the second highest use for most building types. Grocery stores and supermarkets are exceptions to this rule since their electrical usage is dominated by large refrigeration operations. The use of natural gas in commercial buildings is usually limited to space heating and occasionally air-conditioning.

Industrial

In contrast to energy consumption in the residential and commercial sectors, industrial patterns of energy consumption depend upon the specific type of industrial operations.

Energy use within the general category of "industrial processes" includes a number of specific uses. A significant portion of industrial gas use is for the purpose of heating water to various temperatures. The electricity portion of industrial process consumption includes a mixture of lighting, motor operation, and the operation of more sophisticated electronic equipment.

The major industrial activities in Sutter County are high electrical and natural gas users. In general, they use electricity for 60 percent of their energy needs and natural gas for the remaining 40 percent. Electricity is used to run motors, conveyor belts, chipping machines, and manufacturing equipment. Natural gas is consumed for space heating and some specific industrial processes.

In the stone and mineral extraction industry, electricity is used primarily for handling and crushing operations. Drying and additional processing require natural gas and/or fuel oils.

Agricultural

Electricity is important in the agricultural sector since it is the main source of energy used to operate irrigation pumps, fans, and wind producing machines used to protect fruits from winter frost. Natural gas use in the agricultural sector is less significant and is limited to the greenhouse industry, heating of agricultural buildings, and crop drying.

TABLE 11.13-1

**NUMBER OF HOUSING UNITS AND TYPE OF ENERGY CONSUMED,
BY ENERGY NEED**

Fuel	Space Heating	Water Heating	Cooking
Utility Gas	15,180	(14,752)	(6,849)
Bottled, tank, or LP gas	1,247	(1,323)	(1,016)
Electricity	4,782	(2,690)	(10,923)
Fuel Oil, kerosene, etc.	90	--	--
Coal or Coke	--	--	--
Wood	1,761	--	--
Solar Energy	--	--	--
Other fuel	47	(30)	(8)
No fuel used	34	(10)	(13)

Source: U.S. Department of Commerce, Bureau of Census, 1990 & (1980). Census of Housing. Detailed Housing Characteristics. California.

CONSERVATION MEASURES

A reduction in the use of natural gas and conventional electricity supplies can be accomplished by reducing wasteful energy consumption practices and habits. Typically, houses built prior to the 1970's during the time of inexpensive energy have minimal insulation and weatherstripping, and do not reflect a relationship to the climate characteristics of the building site. The primary economic concern at the time of construction was to keep the initial cost of the building and equipment as low as possible. Electrical lights were used in places where windows could have provided much of the lighting needed. Major appliances were designed with little insulation and no energy efficiency concern. Residential furnaces were often oversized in capacity for the heating requirements of the structure.

Environmental and cost concerns tend to provide greater incentives to save energy. There are many options for improving energy efficiency of buildings and equipment. Most of these options are neither new nor highly technical. Although understood for years, they were not economic options given the cost of energy resources at the time. Some measures cause moderate cost increases for a building or appliance; others are merely different ways of designing facilities or using energy and cost no more than the conventional approach.

Title 24 of the California Administrative Code contains provisions for energy conservation in new residences. These provisions are currently enforced by the Building Inspection Program, and create energy savings of approximately 50 percent over residential construction practices used prior to their enactment. It should be noted that failures to build certain efficiencies into the design of long-lived buildings and appliances are often irreversible for the lifetime of the items in question. With refrigerators and furnaces now lasting 20 years or more, and building lifetimes measured in one or one half centuries, decisions to forgo savings are made not just for us, but for our children and grandchildren as well.

Implementation of energy conservation measures during construction of new homes is easier and more cost effective than improving the energy efficiency of existing homes. However, since today's existing building stock is responsible for the major bulk of energy consumption, it is imperative to encourage energy conservation measures in existing structures. Options for reducing local energy use in old and new buildings are discussed below in terms of the energy uses of space heating, water heating, lighting systems, appliances, industrial processes, plumbing, and transportation and land use.

Space Heating

The efficiency with which a structure can be heated and cooled depends on a number of factors, including the type of energy used, orientation and construction of the building, amount of insulation in the building, type of heating and cooling equipment used, and habits of the building's occupants.

Electrical heating appliances are more efficient at the point of use than are natural gas appliances. However, the considerable amount of primary energy required to generate and distribute electricity results in a very inefficient use of this energy form. There are substantial energy losses in the

conversion process, particularly in a fossil fuel power plant and in the transmission of electricity to the buildings where it is used. Small energy losses occur in the transport of natural gas from its source to the final place of consumption and, overall, natural gas presents a much higher efficiency than electricity. On the whole, gas space heating is 60-75 percent efficient, compared to electric space heating efficiencies of 30-40 percent. Title 24 contains provisions discouraging the use of electric space heating in new buildings.

Whether equipped with gas or electricity, there are many opportunities for increasing the efficiency of space heating and cooling. The type of unit built and its orientation, size, and volume contribute to the resulting energy requirement of the building. Generally, buildings which share common walls, such as multi-family and some commercial units, use significantly less energy than detached structures. Common walls reduce the outside surface-to-volume ratio of each unit, so there is less surface area through which heat can pass. Building orientation is also an important factor in determining the amount of energy required for space heating and cooling. Buildings oriented in a north-south direction can take maximum advantage of solar radiation and therefore reduce heating energy needs. In addition, adequate landscaping, providing shading in summer and solar access in winter, can maximize the use of solar designs in space heating and cooling.

The resistance of a wall, ceiling, or floor to heat flow, known as the "R-value", is directly related to the extent of insulation. The greater the "R" value of an insulating material, the greater resistance it has to heat flow. A well-insulated house will have a minimum of R-11 insulation in the walls and R-19 in the ceiling. Under-insulated homes have ceiling insulation rated at less than R-19, typically R-7 or R-11. Improvement of the insulation level of existing houses or apartments, an operation known as retrofitting, can substantially reduce the energy required for space heating. It is estimated that adding R-19 ceiling insulation to an uninsulated residence can save between 20 to 30 percent of the energy necessary for heating.

Windows and exterior doors are major sources of heat losses in a building. Adequate weatherstripping for doors and windows can help reduce air leaks and consequently reduce the heating requirements of a structure. The use of thermopane windows can also contribute to a reduction in energy consumption and can prove to be cost effective.

In addition to the above mentioned energy conservation measures requiring physical changes in a structure or its site, energy savings are achievable if the building occupants are willing to make some behavioral changes. Setting back the thermostat at night can reduce furnace energy use. Shutting off the pilot light on a residential furnace during the warm seasons can reduce annual furnace energy use. Lowering the winter thermostat temperature setting and raising the summer setting reduces the rate at which heat flows in and out of a structure.

Even though most of the energy conservation options discussed above are directed primarily at reducing heating loads, these same measures will often reduce cooling loads as well.

Title 24 establishes required levels of thermal performance for new residential and non-residential buildings. The standards include insulation requirements for ceilings, walls, and floors and weatherstripping requirements for all exterior doors and windows.

Water Heating

Inefficient energy use for water heating results from the use of electric resistance water heaters, little or no insulation around the water heater tank, maintenance of water at a higher temperature than needed, and wasteful use of hot water.

As with space heating, electricity is much less efficient than gas for heating water. Another major source of inefficient thermal performance is the lack of adequate insulation around the hot water tank. Installation of a tank insulation jacket (a layer of R-6 insulation) around the tank's exterior can substantially reduce annual energy requirements for heating water. Reducing the thermostat setting on a typical heater by 10°F and adding shower and faucet flow restrictors can cause additional energy savings. Flow restrictors save energy by reducing the amount of hot water used and the amount of energy required for water pumping.

Title 24 standards for new residential and non-residential buildings set a number of requirements for water heating. The use of electric resistance water heating is discouraged due to its inefficient use of energy. Performance standards are set for all plumbing fixtures to limit water flow, and insulation is required for water pipes that traverse unheated spaces.

Lighting Systems

Typically, the largest single commercial use of energy is for lighting. Lighting is also an important use of energy in the residential sector. Lighting systems, particularly in commercial buildings, tend to uniformly light the interior space. Often the activities occurring do not require the same level of lighting throughout the building, therefore, considerable energy is wasted by unnecessary light fixtures. Additional energy is wasted because lighting adds heat to the building interior, requiring air conditioning equipment to operate longer.

In existing buildings, these inefficient lighting systems can be replaced with more efficient task-oriented lighting which selectively illuminates activity areas. Other options for reducing the energy requirements of lighting include: disconnecting unnecessary light fixtures (delamping) and replacing incandescent lights with more energy efficient fluorescent or sodium-vapor lighting (relamping). It is estimated that lighting energy savings of 25-50 percent are possible by employing these conservation options.

Title 24 Building Codes include illumination efficiency standards for new non-residential building interiors. The standards are based upon the type of activities carried out within a structure.

Appliances

There are a number of voluntary options for reducing energy use by existing appliances. Most of these are aimed at reducing the duration and frequency of appliance use. The more significant options for space and heating appliances have already been described (i.e., setting back thermostats). Utility companies also recommend the following measures to residential customers:

- Check the seals around the door edges of refrigerators and freezers and make sure they are in good condition. Keep the condenser clean so that it can operate most efficiently. Keep manual units as frost-free as possible.
- Skip the drying cycle and prop dishwasher doors open to air dry dishes. Wash only full loads. Use short-wash cycles as much as possible.
- Use cold water in clothes washers whenever possible. Wash full loads only. Use a clothesline instead of a dryer.
- Clean filters regularly in furnaces and heaters. Maintain heater outlets and air intakes in a clean condition.
- Avoid preheating oven. Do not use small pans on large cooking elements. Cover pots and pans as much as possible.

Like buildings, appliances were designed to reduce manufacturing costs and be fairly durable. Now that energy costs have made operation of appliances more expensive, there is sufficient reason to design and use equipment which is more energy efficient.

In order to prevent the continued manufacturing of energy inefficient appliances, California has adopted energy efficiency standards for new appliances (known as Title 20) which require significant energy consumption. At present, standards have been adopted for the following appliances: electric refrigerators, freezers and combined units, gas space heaters, water heaters, plumbing fittings, gas clothes dryers, gas cooking appliances, and air conditioners.

These standards apply to new appliances retailed in California, regardless of where they are manufactured. Typically, the standard for each appliance is stated as a required measure of operation efficiency. Most of the standards include two or more implementing phases, so that manufacturers will have sufficient time to make the necessary design and production changes and to clear present stock inventories. Following each phase deadline, an appliance cannot be sold in California unless it has been tested and certified as complying with the standards.

Industrial Processes

A large potential exists for improving the energy efficiency of industrial operations. However, as with non-residential buildings, the diversity among industries means that no single conservation measure is broadly applicable. Conservation measures must be identified on a plant-by-plant basis. Some of the general options for achieving industrial energy conservation are summarized below. Monitoring of industrial processes can lead to improvements in energy efficiency. Changes in the timing of processing operations or in the monitoring practices themselves can result in substantial energy savings. Maintaining optimal boiler efficiencies by monitoring flue gases and adjusting boiler equipment is one example. The use of automatic timing devices on equipment which is used only intermittently is another option.

Modifying industrial equipment to improve its energy efficiency generally requires substantial investment, but the energy and dollar savings can be significant. Installing equipment to recover and use waste heat given off by process hot water, steam, and other heat sources to generate electricity (cogeneration) is already successfully in use in the County.

New processes coming into use for a number of industries will significantly decrease the energy requirements of new plants and equipment. In the design of new plants and processes, there are often capital or labor-intensive alternatives available which will save energy compared to the more economic options. With today's increasing energy prices, these energy conserving alternatives are becoming more economic as the energy cost savings potential begins to offset the added capital costs.

Pumping

Water pumping is conducted mainly through the use of electricity. Most of this end use is attributable to pumping water to irrigate crops. State programs are available for the peak load of electrical energy used for agricultural water pumping. Further study of using time-of-way pricing to promote crop irrigation during off peak, night time hours could be appropriate. The energy efficiency of all pumping can be improved with adjustments to, and maintenance of, pumping equipment.

Transportation and Land Use Planning

Conventional land use development patterns have tended to be energy inefficient. The cause and effect relationships between land use patterns and energy consumption are not completely understood, but the following development trends appear to be associated with greater energy consumption:

- Suburban residential development located far from employment, commercial, and transit routes require greater dependence on the automobile;
- Development of outlying areas makes the provision of transit and other public services more costly and less efficient; and
- Low density land use plans that provide low density, detached development requires more energy for use in space heating and cooling compared to higher density units with common walls.

The increased energy consumption associated with these development patterns contribute to increased air pollution and other environmental problems. The relationships between energy consumption, land use planning, and air quality have been determined in the past years, and are reflected in documents such as Air Quality Attainment Plans.

11.14 FINDINGS

- Local energy needs can likely be met over the short-term (5-10 years) without new sources of energy development.
- New transmission line and substation development is not necessary in the short-term to serve expected growth.
- The primary considerations for the siting of new cogeneration facilities is fuel availability and the access to existing transmission lines.
- Air quality issues pose significant regulatory and environmental constraints to the development of new cogeneration and waste to energy facilities.
- The availability of low-cost, environmentally safe fuel for waste to energy plants will likely drive the future development of these facilities.
- Hydroelectric energy projects are not feasible in the County.
- Oil and coal energy resources are not known to exist in the County.
- The County has extensive natural gas resources. Continued production is likely.
- Building orientation and incorporation of energy conservation measures used during construction of new buildings will reduce energy use.

11.15 PERSONS CONSULTED

Bartolome, Art, Service Planning Supervisor. Pacific Gas & Electric

Cambel, Tony, Engineering and Maintenance Manager. Sunsweet

Horne, Mike, Plant Superintendent. Greenleaf Cogeneration

Kercheval, Melody, Planning Analyst. Pacific Gas & Electric

Torkelson, Jim, Senior New Business Representative. Pacific Gas & Electric

White, Lorane, Planning Division of the California Energy Commission

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CHAPTER 12

NOISE

12.1 INTRODUCTION

The purpose of this chapter is to quantify the current, or baseline, and projected noise conditions in the unincorporated county (i.e., areas excluding the incorporated areas of Yuba City and Live Oak). Specifically this involves:

- Quantifying existing noise levels from major noise sources in the County;
- Identifying existing land uses that are sensitive to noise, including residential areas, hospitals or healthcare facilities, libraries, parks, and schools; and
- Identifying conflicts between existing noise sources and noise-sensitive uses.

The noise information in this chapter has been prepared in accordance with Guidelines for the Preparation and Content of the Noise Element of the General Plan issued by the California Department of Health Services and the State of California General Plan Guidelines published by the Office of Planning and Research.

BACKGROUND INFORMATION ON ENVIRONMENTAL ACOUSTICS

Noise Terminology

Sound travels through the air as waves of minute air pressure fluctuations caused by some type of vibration. In general, sound waves travel away from the noise source as an expanding spherical surface. The energy contained in a sound wave is consequently spread over an increasing area as it travels away from the source. This results in a decrease in loudness at greater distances from the noise source.

Sound-level meters measure the pressure fluctuations caused by sound waves. Because of the ability of the human ear to respond to a wide dynamic range of sound pressure fluctuations, loudness is measured in terms of a logarithmic decibel (dB) scale. The scale measures pressure fluctuations in a convenient notation and corresponds to our auditory perception of increasing loudness.

Most sounds consist of a broad range of sound frequencies. Because the human ear is not equally sensitive to all frequencies, several frequency-weighting schemes have been used to develop composite decibel scales that approximate the way the human ear responds to noise levels. The **A-weighted decibel scale** (dBA) is the most widely used for this purpose. Typical A-weighted noise levels for various types of sound sources are summarized in Figure 12.1-1.

Time-varying sound levels are often described in terms of an equivalent constant decibel level. Equivalent sound levels (L_{eq}) are used to develop single-value descriptions of average noise exposure over various periods of time. Such average noise exposure values often include additional weighting factors for annoyance potential attributable to time of day or other considerations. The L_{eq} data used for these average noise exposure descriptors are generally based on A-weighted sound-level measurements.

Average noise exposure over a 24-hour period is often presented as a day-night average sound level (L_{dn}). L_{dn} values are calculated from hourly L_{eq} values, with the L_{eq} values for the nighttime period (10 p.m.-7 a.m.) increased by 10 dB to reflect the greater disturbance potential from nighttime noise.

The **community noise equivalent level** (CNEL) is also used to characterize average noise levels over a 24-hour period, with weighting factors included for evening and nighttime noise levels. L_{eq} values for the evening period (7 p.m.-10 p.m.) are increased by 5 dB, while L_{eq} values for the nighttime period (10 p.m.-7 a.m.) are increased by 10 dB.

Another noise metric often used to describe a given noise environment is the **percentile level**. This is the sound level that is exceeded during a given percentage of a stated measurement period. An example of this is L_{10} , which is the sound level exceeded 10% of the time. L_1 , L_{10} , L_{50} , L_{90} , and L_{99} are the most commonly used exceedance metrics. L_1 generally corresponds to the maximum sound level during the measurement period, L_{99} is the minimum noise level, L_{50} is the median sound level, and L_{90} is usually considered to represent the ambient sound level.

Ambient noise is the all-encompassing noise associated with a given environment at a specified time that is usually a composite of sound from many sources at many directions near and far. No particular sound is dominant in ambient noise.

Noise contours are lines drawn on a map around a source indicating constant levels of noise exposure. L_{eq} , L_{dn} , and CNEL are commonly used noise contour metrics.

FIGURE 12.1-1

A-Weighted Sound Levels and Human Response

Sound Source	Sound Level (dBA)	Response
Carrier deck jet operation >	140	
Civil defense siren (at 100 feet) >	130	Painfully loud
Jet takeoff (at 200 feet) >	120	Threshold of feeling and pain
Riveting machine (at 1 foot) > Rock music concert >	110	
Pile driver (at 50 feet) > Ambulance siren (at 100 feet) >	100	Very loud
Heavy truck (at 50 feet) >	90	
Pneumatic drill (at 50 feet) > Freight cars (at 50 feet) >	80	
Garbage disposal in home > Freight cars (at 100 feet) > Freeway traffic (at 50 feet) > Vacuum cleaner (at 10 feet) >	70	Moderately loud
Air conditioning unit (at 20 feet) >	60	
Speech in normal voice (at 15 feet) >	50	
Residence—typical movement of people, no TV or radio >	40	Quiet
Soft whisper (at 5 feet) >	30	
Recording studio >	20	
	10	
	0	Threshold of hearing

Equivalencies between Various Noise Descriptors

The value at a site calculated from a set of measurements taken over a given 24-hour period will be slightly lower than the CNEL value calculated over the same time period. Except in situations where unusually high evening noise levels occur, the CNEL value will be within 1.5 dB of the L_{dn} value for the same set of noise measurements.

The relationship between peak hourly L_{eq} values from traffic and associated L_{dn} values depends on the distribution of traffic over the entire day. There is no precise way to convert a peak hourly L_{eq} value to an L_{dn} value. However, in urban areas near heavy traffic, the peak hourly L_{eq} value is typically 2-4 dB lower than the daily L_{dn} value. In less heavily developed areas, the peak hourly L_{eq} is often equal to the daily L_{dn} value. In rural areas with little nighttime traffic, the peak hourly L_{eq} value will often be 3-4 dB greater than the daily L_{dn} value.

Working with Decibel Values

The nature of dB scales is such that the individual sound level for different noise sources cannot be added directly to give the combined sound level of these sources. Two noise sources producing equal sound levels at a given location will produce a composite sound level that is 3 dB greater than either sound alone. When two noise sources differ by 10 dB, the composite noise level will be only 0.4 dB greater than the louder source alone.

Most people have difficulty distinguishing the louder of two noise sources if they differ by less than 1.5-2.0 dB. Research into the human perception of changes in sound level indicates the following:

- A 3-dB change is just perceptible.
- A 5-dB change is clearly perceptible.
- A 10-dB change is perceived as being twice or half as loud.

When distance is the only factor considered, sound levels from an isolated noise source will typically decrease by about 6 dB for every doubling of distance away from the noise source. When the noise source is essentially a continuous line (e.g., vehicle traffic on a highway), noise levels decrease by about 3 dB for every doubling of distance. In traffic noise studies, a drop-off rate of 4.5 dB per doubling of distance is often used when the intervening ground between the roadway and the receiver is acoustically "soft" (e.g., ground vegetation, scattered trees, clumps of bushes).

Noise levels at different distances can also be affected by a number of factors other than just the distance from the noise source. Topographic features and structural barriers that absorb, reflect, or scatter sound waves can result in increased or decreased noise levels. Atmospheric conditions (wind speed and direction, humidity levels, and temperatures) can also affect the degree to which sound is attenuated over distance.

Echoes off topographical features or buildings can sometimes result in higher sound levels (lower sound attenuation rates) than normally expected. Temperature inversion and altitudinal changes in wind conditions can at times refract sound waves to a location at a considerable distance from the noise source.

GUIDELINES FOR INTERPRETING NOISE LEVELS

Various federal, state, and local agencies have developed guidelines for evaluating land use compatibility under different noise level ranges.

Federal Agency Guidelines

The Federal Noise Control Act of 1972 (Public Law 92-574) established a requirement that all federal agencies must administer their programs to promote an environment free of noise that jeopardizes public health or welfare. The U.S. Environmental Protection Agency (EPA) was given the responsibility for:

- Providing information to the public regarding identifiable effects of noise on public health or welfare,
- Publishing information on the levels of environmental noise that will protect the public health and welfare with an adequate margin of safety,
- Coordinating federal research and activities related to noise control, and
- Establishing federal noise emission standards for selected products distributed in interstate commerce.

The Federal Noise Control Act also directed that all federal agencies comply with applicable federal, state, interstate, and local noise control regulations.

Although the EPA was given major public information and federal agency coordination roles, each federal agency retains authority to adopt noise regulations pertaining to agency programs. The EPA can require other federal agencies to justify their noise regulations for compliance with the Noise Control Act requirements. The Occupational Safety and Health Administration retains primary authority for setting workplace noise exposure standards. The Federal Aviation Administration retains primary jurisdiction over aircraft noise standards.

In 1974, in response to the requirements of the federal Noise Control Act, the EPA identified indoor and outdoor noise limits to protect public health and welfare (communication disruption, sleep disturbance, and hearing damage). Outdoor L_{dn} limits of 55 dB and indoor L_{dn} limits of 45 dB are identified as desirable to protect against speech interference and sleep disturbance for residential, educational, and healthcare areas. Noise-level criteria to protect against hearing damage in commercial and industrial areas are identified as 24-hour L_{eq} values of 70 dB (both outdoors and indoors).

The Federal Highway Administration (FHWA) has adopted criteria for evaluating noise impacts associated with federally funded highway projects and for determining whether these impacts are sufficient to justify funding noise mitigation actions (47 FR 131:29653-29656, July 8, 1982). The FHWA noise abatement criteria are based on peak hourly L_{eq} noise levels, not L_{dn} or 24-hour L_{eq} values. The peak 1-hour L_{eq} criteria for residential, educational, and healthcare facilities are 67 dB outdoors and 52 dB indoors. The peak 1-hour L_{eq} criterion for commercial and industrial areas is 72 dB (outdoors).

The U.S. Department of Housing and Urban Development has established guidelines for evaluating noise impacts on residential projects seeking financial support under various grant programs (44 FR 135:40860-40866, January 23, 1979). Sites are generally considered acceptable for residential use if they are exposed to outdoor L_{dn} values of 65 dB or less. Sites are considered "normally unacceptable" if they are exposed to outdoor L_{dn} values of 65-75 dB. Sites are considered unacceptable if they are exposed to outdoor L_{dn} values above 75 dB.

State Agency Guidelines

In 1987, the California Department of Health Services published guidelines for the noise element of local general plans. These guidelines include a noise level/land use compatibility chart that categorizes various outdoor L_{dn} ranges into up to four compatibility categories (normally acceptable, conditionally acceptable, normally unacceptable, and clearly unacceptable), depending on land use. For many land uses, the chart shows overlapping L_{dn} ranges for two or more compatibility categories. The noise element guidelines chart identifies the normally acceptable range for low-density residential uses as less than 60 dB, while the conditionally acceptable range is 55-70 dB. The normally acceptable range for high-density residential uses is identified as L_{dn} values below 65 dB, while the conditionally acceptable range is identified as 60-70 dB. For educational and medical facilities, L_{dn} values below 70 dB are considered normally acceptable, while L_{dn} values of 60-70 dB are considered conditionally acceptable. For office and commercial land uses, L_{dn} values below 70 dB are considered normally acceptable, while L_{dn} values of 67.5-77.5 are categorized as conditionally acceptable.

These overlapping L_{dn} ranges are intended to indicate that local conditions (existing noise levels and community attitudes toward dominant noise sources) should be considered in evaluating land use compatibility at specific locations.

The California State Aeronautics Noise Standards state that an outdoor sound level of 65 CNEL is acceptable for residences and schools. Standards are not specified for other potentially noise-sensitive land uses.

The California Department of Housing and Community Development has adopted noise insulation performance standards for new hotels, motels, and dwellings other than detached single-family structures (24 CCR T25-28). These standards require that "interior CNEL with windows closed, attributable to exterior sources, shall not exceed an annual CNEL of 45 dB in any habitable room."

Other Local Guidelines

The City of Sacramento has adopted specific noise land use compatibility criteria for evaluating noise effects from airports. Although these standards do not apply in Sutter County, they are mentioned here as a point of reference. Sacramento considers exterior noise from Sacramento International Airport (Sac International) as high as 60 CNEL to be acceptable for residences and schools. For all other airports, 65 CNEL is considered to be acceptable.

EXISTING NOISE CONDITIONS IN SUTTER COUNTY

Existing noise conditions in Sutter County are described by:

- Identifying noise sources and, to the extent possible, quantifying noise from these sources;
- Identifying existing land uses that are sensitive to noise; and
- Identifying conflicts between existing noise sources and noise-sensitive uses.

Noise Sources

The dominant sources of noise in Sutter County are related to transportation and include automobile and truck traffic, aircraft, and trains. Stationary sources in the County include natural gas extraction facilities, construction sites, mining activities, farming activities, and commercial and industrial facilities. These various sources are described in the next section.

Roadway Traffic

State Routes (SRs) 20, 70, 99, and 113 are major sources of traffic noise in the County. Some County roads, primarily those that serve as collectors and arterials in the vicinity of Yuba City, are significant sources of traffic noise. County roads that currently have daily traffic volumes in excess of 2,000 vehicles per day are listed in Table 12.1-1.

Noise levels produced by traffic on state highways and county roads with more than 2,000 vehicles per day have been calculated using the FHWA Traffic Noise Prediction Model (FHWA-RD-77-108). The model estimates traffic noise levels based on roadway geometrics; traffic volumes for automobiles, medium trucks (with two axles and six tires), and heavy trucks (with three or more axles); vehicle speeds; and a noise attenuation rate parameter. A computer-based implementation of the model was used that directly calculates L_{dn} values based on hourly traffic patterns, hourly truck percentages, and hourly speeds adjusted by the degree of congestion.

Truck percentages assumed in the analysis are based on data provided by California Department of Transportation, FHWA, and the County and are summarized in Table 12.1-2. Data on the roadways and traffic volumes were provided by the County. These data and calculated noise levels are summarized in Tables 12.1-1 and 12.1-4. The calculated L_{dn} values at 100 feet from the roadway centerline along with the distance to the 70-, 65-, 60-, and 55- L_{dn} contours are given. Figure 12.1-2 depicts 60- L_{dn} traffic noise contours lines for roadways in the unincorporated area around Yuba City.

TABLE 12.1-1
SUMMARY OF TRAFFIC DATA AND NOISE MODELING FOR COUNTY ROADS UNDER EXISTING CONDITIONS

Roadway	From	To	Roadway Classification	Number of Lanes	Traffic Volume	Speed (mph)	L _{dn} at 100 Feet	Distance to 70 L _{dn} Contour ^a	Distance to 65 L _{dn} Contour ^a	Distance to 60 L _{dn} Contour ^a	Distance to 55 L _{dn} Contour ^a
Acacia Avenue	Butte House Road	State Route 20	RC	2	3,030	60	62	30	65	140	302
Bogue Road	Garden Highway	State Route 99	RC	2	2,220	60	61	24	52	113	244
	State Route 99	Walton Avenue	RC	2	2,260	60	61	25	53	115	247
Butte House Road	Yuba City limit	Harter Road	UA	2	12,400	45	66	52	111	240	517
	Harter Road	Hooper Road	UA	2	8,060	45	64	39	83	179	386
	Hooper Road	Township Road	UA	2	4,490	45	61	26	57	122	263
	Township Road	Humphrey Road	RA	2	3,100	60	62	31	66	142	307
	Humphrey Road	Acacia Avenue	RA	2	3,140	60	62	31	66	142	307
Franklin Road	State Route 99	Walton Avenue	RA	2	8,790	60	67	61	132	284	612
	Walton Avenue	El Margarita Road	RA	2	7,410	60	66	55	118	255	550
	El Margarita Road	G. Washington Road	RA	2	5,860	60	65	46	100	215	464
	G. Washington Road	Township Road	RA	2	4,670	60	64	40	87	188	404
Garden Highway	North of Lincoln Road		UA	3	10,510	45	65	46	100	215	464
	Yuba City limits	State Route 99	RA	2	2,360	60	61	26	55	118	255
G. Washington Road	Oswald Road	Lincoln Road	RA	2	3,070	60	62	30	65	140	302
	Lincoln Road	Franklin Road	RA	2	3,180	60	62	31	67	145	311
	Franklin Road	State Route 20	RA	2	6,120	60	65	48	103	222	479
Hooper Road	Colusa Frontage Road	Butte House Road	RC	2	2,440	60	61	26	56	120	259
Lincoln Road	West of Garden Highway		UA	2	5,820	45	62	31	67	145	311
	Jones Road	State Route 99	UA	2	10,860	45	65	47	102	219	471

TABLE 12.1-1 CON'T.

Roadway	From	To	Roadway Classification	Number of Lanes	Traffic Volume	Speed (mph)	L _{dn} at 100 Feet	Distance to 70 L _{dn} Contour ^a	Distance to 65 L _{dn} Contour ^a	Distance to 60 L _{dn} Contour ^a	Distance to 55 L _{dn} Contour ^a
	State Route 99	Walton Road	UA	2	8,560	45	64	40	87	188	404
	Walton Road	G. Washington Road	UA	2	4,670	45	61	27	58	124	267
Live Oak Boulevard	Yuba City limit	Pease Road	RA	2	7,360	60	66	54	117	251	541
	Pease Road	State Route 99	RA	2	5,410	60	65	44	95	206	443
Railroad Avenue	Oswald Road	Bogue Road	RC	2	2,360	60	61	26	55	118	255
Richland Road	Clark Avenue	State Route 99	RC	2	2,650	60	62	28	59	128	275
	State Route 99	Walton Avenue	RC	2	2,050	60	61	23	50	108	233
Riego Road	Placer County line	State Routes 99/70	RC	2	4,110	60	64	37	79	171	369
Tierra Buena Road	Hooper Road	Pease Road	RC	2	2,520	60	61	27	58	124	267
Township Road	Franklin Road	State Route 20	RA	2	2,260	60	61	25	53	115	247
	State Route 20	Butte House Road	RA	2	2,520	60	61	27	58	124	267
Walton Avenue	Bogue Road	Lincoln Road	UA	2	7,170	45	63	36	77	166	358
	Lincoln Road	Franklin Road	UA	2	6,600	45	63	34	72	156	336
	Franklin Road	Yuba City limits	UA	2	11,870	45	66	50	108	233	501

^a distance is shown in feet.

Key: RA = rural arterial, RC = rural collector, UA = urban arterial.

Note: All distances are measured from the centerline of the roadway.

Source: Sutter County Planning Department, Jones & Stokes Associates.

Aircraft

Aircraft operations in the vicinity of airports can be a significant source of noise. Sutter County Airport is the only publicly owned and operated airport in the county. There are also a number of small privately owned and operated landing strips and airports. Airports located in the County are identified in Figure 4.13-1. Noise from aircraft traffic at Sacramento International, which is located about a mile south of the southern border of Sutter County, also influences the noise environment in Sutter County.

In 1993, the Airport Land Use Commission updated noise contour maps for both the Sutter County Airport and Sacramento International. The 65-CNEL contour for Sutter County Airport is depicted in Figure 12.1-4. The 60- and 65-CNEL contours for Sacramento International are depicted in Figure 12.1-4.

Activity at small private landing strips is highly variable. In cases where the strip is used primarily for crop dusting, the use will vary with the farming season. Because use of these strips is highly variable, it is not practical to develop CNEL contours. However, data are available on typical sound levels generated by small aircraft as a function of distance. These data are summarized in Table 12.1-3.

TABLE 12.1-2**TRUCK PERCENTAGES USED IN THE
TRAFFIC NOISE MODELING ANALYSIS**

Roadway	Location	Autos	Medium Trucks	Heavy Trucks	Total Trucks
State Route 20	Rural	91.0	4.9	4.1	9.0
	Urban	94.0	2.7	3.3	6.0
State Route 70		92.2	2.2	5.6	7.8
State Highway 99	South SR-113	88.0	3.5	8.5	12.0
	SR-113 to Oswald Rd	83.0	4.2	12.8	17.0
	Oswald Rd to Encinal Rd	92.3	2.3	5.4	7.7
	North to Encinal Rd	86.5	4.7	8.8	13.5
State Route 113		89.9	2.9	7.2	10.1
All county roads		94.0	2	4	6.0

Source: California Department of Transportation 1991, Rudder and Yaniv 1986.

TABLE 12.1-3**TYPICAL SOUND LEVELS GENERATED BY SMALL AIRCRAFT
MAXIMUM A - WEIGHTED SOUND LEVEL (dBA)**

Slant Distance (feet)	Single Engine Takeoff	Single Engine Landing	Twin Engine Takeoff	Twin Engine Takeoff
500	74	66	80	72
1,000	71	63	77	69
2,000	67	59	73	65
4,000	63	55	69	61
8,000	58	50	64	56

Sources: Miller 1982, Bishop 1975

TABLE 12.1-4
SUMMARY OF TRAFFIC DATA AND NOISE MODELING FOR STATE ROUTES UNDER EXISTING CONDITIONS

Roadway	From	To	Roadway Classification	Number of Lanes	Daily Traffic Volume	Speed (mph)	Ldn at 100 Feet	Distance to 70 Ldn Contour (feet)	Distance to 65 Ldn Contour (feet)	Distance to 60 Ldn Contour (feet)	Distance to 55 Ldn Contour (feet)
State Route 20	Colusa County Line	Sutter Bypass	RA	2	5,300	60	66	53	115	247	533
	Sutter Bypass	Acacia Avenue	RA	2	6,500	60	67	61	132	284	612
	Acacia Avenue	Township Road	EX	4	6,100	60	66	54	117	251	541
	Township Road	G. Washington Boulevard	EX	4	10,000	60	68	75	161	347	747
	G. Washington Boulevard	Yuba City limits	EX	4	13,900	60	70	94	203	437	940
State Route 70	Junction SR-99	Yuba County Line	RA	2	10,300	60	69	88	191	411	884
State Route 99	Sacramento County Line	Junction SR-70	EX	4	22,000	60	74	188	404	871	1876
	Junction SR-70	Garden Highway	RA	2	9,500	60	70	103	222	479	1031
	Garden Highway	Junction SR-113	RA	2	8,600	60	70	95	206	443	955
	Junction SR-113	Oswald Road	RA	2	11,500	60	72	142	307	661	1423
	Oswald Road	Bogue Road	RA	2	14,500	60	71	110	236	509	1096
	Bogue Road	Lincoln Road	EX	4	15,600	60	71	120	259	558	1202
	Lincoln Road	Franklin Road	EX	4	22,000	60	73	151	326	703	1514
	Franklin Road	Yuba City limits	EX	4	28,800	60	74	182	392	845	1820
	Yuba City limits	Eager Road	FWY	4	13,000	60	70	106	229	494	1063
	Eager Road	end freeway	FWY	4	11,000	60	70	94	203	437	940
	begin expressway	Encinal Road	RA	2	14,700	60	71	115	247	533	1148
	Encinal Road	Pennington Road	RA	2	16,600	60	67	61	132	284	612
	Pennington Road	Butte County Line	RA	2	11,500	60	65	48	103	222	479
State Route 113	Yolo County Line	Knights Road	RA	2	5,100	60	67	65	140	302	651
	Knights Road	Del Monte Avenue	RA	2	5,500	60	68	68	147	316	681
	Del Monte Avenue	Junction SR-99	RA	2	4,800	60	67	62	134	288	621

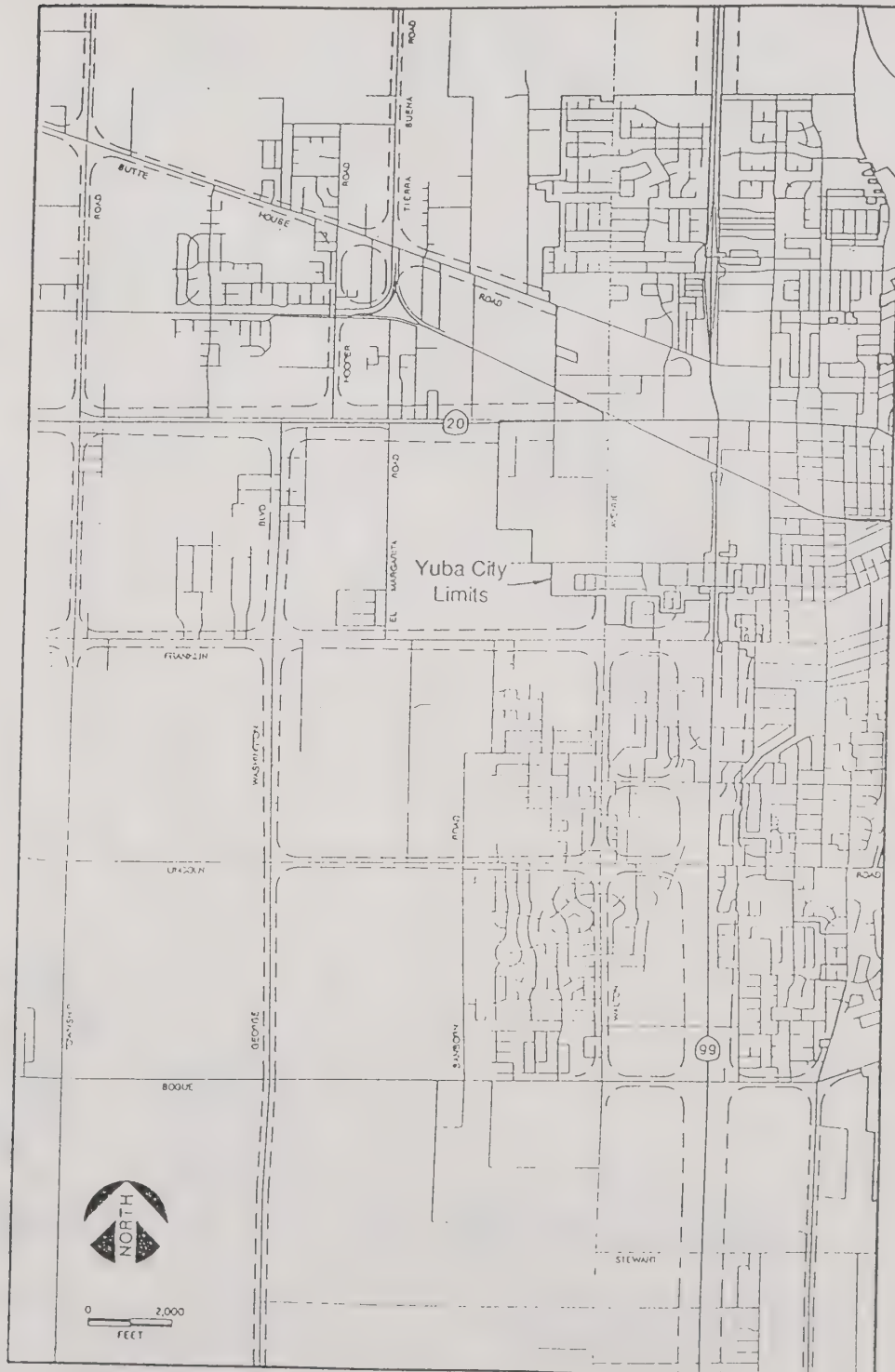
Key: FWY = Freeway, EX = Expressway, RA = Rural Arterial.

Note: All distances are measured from the centerline of the roadway.

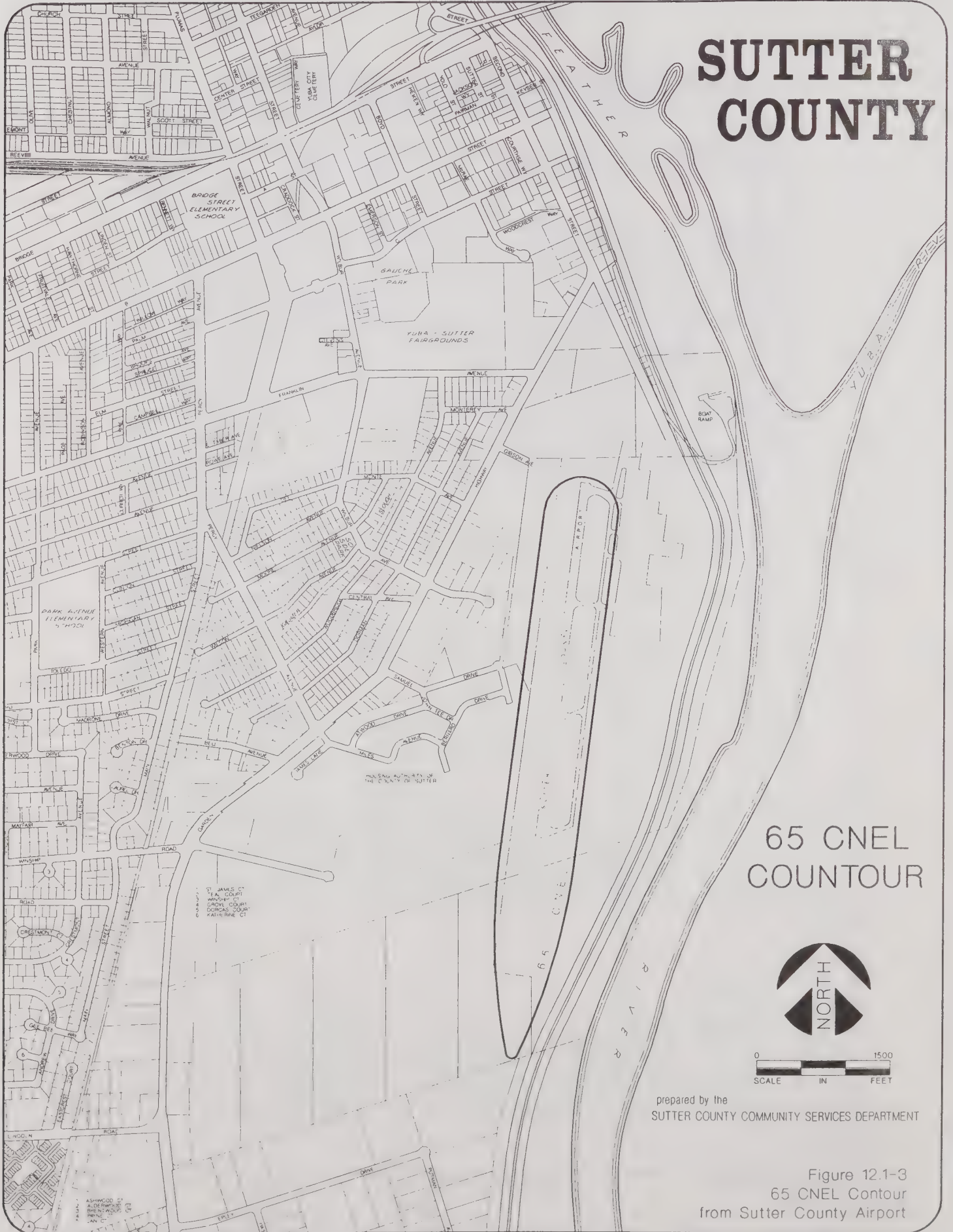
Source: Sutter County Planning Department, Jones & Stokes Associates.

FIGURE 12.1-2

EXISTING 60 LDN TRAFFIC NOISE CONTOURS
IN THE YUBA CITY URBAN AREA



SUTTER COUNTY



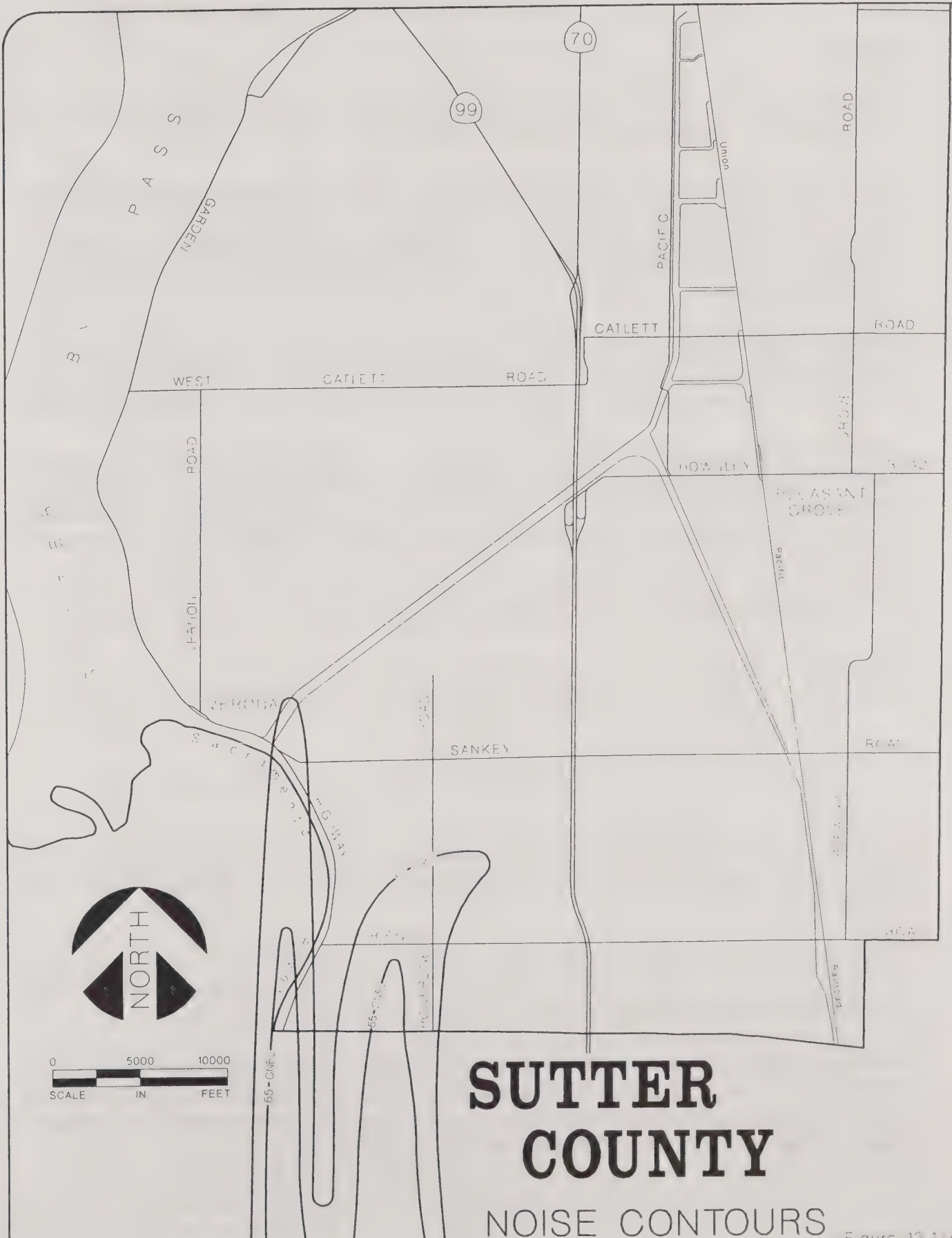
65 CNEL
COUNTOUR



0 1500 3000
SCALE IN FEET

prepared by the
SUTTER COUNTY COMMUNITY SERVICES DEPARTMENT

Figure 12.1-3
65 CNEL Contour
from Sutter County Airport



Trains

Two rail lines are active in Sutter County, one operated by the Southern Pacific Transportation Company (SPTC) and the other by the Union Pacific (UP).

Noise from rail operations has been modeled using methodology developed by Lotz and Kurzweil (Harris 1979) with support from the Office of Technology Development and Deployment of the Urban Mass Transportation Administration (now the Federal Transit Administration). Train noise attenuation has been calculated using 4.5 dB per doubling of distance as recommended by Piercy and Daigle (Harris 1991).

Southern Pacific Transportation Company. The SPTC track is identified in Figure 4.13-1. The track enters the County just north of Yuba City and runs north parallel to Live Oak Boulevard and then to SR 99. The track passes through Live Oak and exits the county just north of Riviera Road.

An average of 22 trains per day use the tracks, with 20 being freight trains and two being passenger trains. The average train length is 4,500 feet corresponding to about 65 cars. Ten trains pass during daytime and evening hours (7 a.m. to 10 p.m.) and 12 trains pass during nighttime hours (10 p.m. to 7 a.m.). The average speed is 55 miles per hour. Calculated L_{dn} values for these train operations are as follows:

<u>Distance from Track</u>	<u>Calculated Noise Level</u>
100 feet	76 L_{dn}
115 feet	75 L_{dn}
250 feet	70 L_{dn}
540 feet	65 L_{dn}
1,170 feet	60 L_{dn}

SPTC also uses the Yuba City Branch, which connects Yuba City and Marysville. The track is used once a day with a maximum speed of 15 miles per hour. The calculated L_{dn} value at 100 feet is less than 50 dB.

Union Pacific. The UP track is identified in Figure 4.13-1. The track enters the County at the southeast corner of the county south of Pleasant Grove. The tracks then go northwest through Trowbridge and exit the County just north of Rio Oso.

An average of 14 freight trains per day use the tracks. The average train length is about 1 mile, which corresponds to about 75 cars. Seven trains pass during daytime and evening hours (7 a.m. to 10 p.m.) and seven trains pass during nighttime hours (10 p.m. to 7 a.m.). The average speed is 60 miles per hour. Calculated L_{dn} values for these train operations are as follows:

Distance from TrackCalculated Noise Level

100 feet	75 L _{dn}
215 feet	70 L _{dn}
465 feet	65 L _{dn}
1,000 feet	60 L _{dn}

Natural Gas Extraction Facilities

A significant amount of natural gas is produced in Sutter County. Natural gas fields in the County are identified in Figure 9.5-1. Operations associated with the extraction of natural gas can be a significant source of noise. In Sutter County, natural gas wells require, at a minimum, zoning clearances and in certain situations conditional use permits for surface locations, with special considerations made for access routes and possible conflicts with agricultural activities and environmental factors. Special noise control treatments are required if a well is located within 500 feet of a residence.

Drilling operations are normally conducted on a 24-hour-a-day basis with drilling normally being completed within 10-14 days. A reciprocating natural gas compressor is then put in place at the well head to pressurize the gas for transmission. According to Mike Philips of Anacapa Oil, gas compressors used in Sutter County range in size from 23 horsepower (rated) to 400 horsepower. Approximately 70-85% of the compressors in use range in size from 60 to 120 horsepower. Mr. Philips has measured sound levels of about 94 dBA as measured 10-15 feet from a compressor. This is consistent with predicted sound levels for 60- to 120-horsepower units with muffled exhaust.

A dBA of 94 at 15 feet corresponds to 84 dBA at 50 feet. Using this source noise level and assuming nominal attenuation from atmospheric absorption, the distance to the 70-, 60-, and 50-dBA contours are as follows:

Distance from SourceCalculated Noise Level

50 feet	84 dBA
240 feet	70 dBA
735 feet	60 dBA
1,920 feet	50 dBA

Construction Sites

Figure 12.1-5 illustrates noise levels produced by various types of construction equipment. Properly maintained equipment will produce noise levels near the middle of the indicated ranges. The types of construction equipment used for a typical construction project will usually generate noise levels of 80-90 dBA at a distance of 50 feet while the equipment is operating (U.S. Environmental Protection Agency 1971). Construction equipment operations can vary from intermittent to fairly continuous, with multiple pieces of equipment operating concurrently. Assuming that a bulldozer (87 dBA), backhoe (90 dBA), grader (90 dBA), and front-end loader (82 dBA) are operating concurrently in the same area, peak construction-period noise could be as high as about 94 dBA at 50 feet from a construction site.

Using a source level of 94 dBA at 50 feet and assuming nominal attenuation from atmospheric absorption, the distance to the 70-, 60-, and 50-dBA contours are as follows:

<u>Distance from Source</u>	<u>Calculated Noise Level</u>
50 feet	94 dBA
735 feet	70 dBA
1,920 feet	60 dBA
4,000 feet	50 dBA

Mining Activities

Mining activities in the County are limited primarily to sand and gravel extraction (Follas pers. comm.). Materials are extracted using heavy equipment. Blasting is rarely if ever needed. Noise generated by mining activities is variable depending on the intensity of the operations. Heavy equipment used in the mining operations include bulldozers, front end loaders, and other heavy construction-type vehicles. Typical noise levels generated by this equipment are summarized in Figure 12.1-5. Peak noise levels would be similar to those from a construction site as described above (94 dBA as measured at 50 feet).

Using a source level of 94 dBA at 50 feet and assuming nominal attenuation from atmospheric absorption, the distance to the 70-, 60-, and 50-dBA contours are as follows:

<u>Distance from Source</u>	<u>Calculated Noise Level</u>
50 feet	94 dBA
735 feet	70 dBA
1,920 feet	60 dBA
4,000 feet	50 dBA

Farming Activity

The primary sources of noise related to farming activity are tractors, harvesters, and crop-dusting aircraft. Typical noise levels from tractors as measured at a distance of 50 feet range from about 75 dBA to 95 dBA with an average of about 84 dBA (Toth 1979). These noise levels should be reasonably representative of noise levels from other wheeled and tracked farm equipment.

FIGURE 12.1-5

CONSTRUCTION EQUIPMENT NOISE RANGES

CONSTRUCTION EQUIPMENT	Noise Level (dBA) at 50 feet					
	60	70	80	90	100	110
Equipment Powered by Internal Combustion Engines						
Earthmoving						
Compactors (rollers)		70-75				
Front loaders		70-85				
Backhoes		70-90				
Tractors		75-95				
Scrapers, graders		80-90				
Pavers			85-90			
Trucks			80-95			
Materials Handling						
Concrete mixers		75-90				
Concrete pumps			80-85			
Cranes (movable)		75-90				
Cranes (derrick)			85-90			
Stationary						
Pumps		65-70				
Generators		70-85				
Compressors		75-90				
Impact Equipment						
Pneumatic wrenches			80-85			
Jackhammers and rock drills			80-95			
Pile drivers (peaks)				95-105		
Other						
Vibrators		70-85				
Saws		75-85				

Using a source level of 84 dBA at 50 feet and assuming nominal attenuation from atmospheric absorption, the distance to the 70-, 60-, and 50-dBA contours are as follows:

<u>Distance from Source</u>	<u>Calculated Noise Level</u>
50 feet	84 dBA
240 feet	70 dBA
735 feet	60 dBA
1,920 feet	50 dBA

Noise from small aircraft as a function of distance is summarized in Table 12.1-3. This table can be used to estimate noise from crop dusters.

Other Miscellaneous Facilities and Plants

Several commercial, industrial, and agricultural facilities located throughout the County are sources of noise. These include several grain storage facilities, a small commercial/industrial center west of Yuba City near the intersection of George Washington Boulevard and SR 20, and the SWECO Products facility located in Sutter. These areas are identified in Figure 12.1-6.

Noise at grain storage facilities is associated primarily with vehicles arriving and departing to deliver grain and with mechanical conveyance systems. Overall noise levels generated at these facilities is highly variable depending on the season and the associated activity. Transport trucks with engine sizes between 100 and 400 horsepower produce maximum sound levels at 50 feet between 81 and 87 dBA (Miller 1982). At 50 feet, conveyance systems produce sound levels in the range of 70-80 dBA with a typical average of about 77 dBA (Miller 1982).

Peak noise from trucks combined with conveyance noise would result in an overall noise level of about 87 dBA as measured at 50 feet. Using this source level and assuming nominal attenuation from atmospheric absorption, the distance to the 70-, 60-, and 50-dBA contours are as follows:

<u>Distance from Source</u>	<u>Calculated Noise Level</u>
50 feet	87 dBA
350 feet	70 dBA
975 feet	60 dBA
2,440 feet	50 dBA

Different business are located in the commercial/industrial area near the intersection of George Washington Boulevard and SR 20. Businesses include small manufacturing and fabrication companies, auto repair shops, and other commercial facilities. Noise associated with these operations is intermittent and comes from sources such as forklift activity in equipment yards, delivery trucks, and repair shop activity. Noise from these activities is generally confined to the property of the business and is so small or intermittent that meaningful quantification of off-site noise is not possible.

The only major manufacturing facility in the County is SWECO Products, which is located in the Sutter community area bounded by California Street, Sutter Avenue, Pepper Street, and Barrow Street. SWECO Products manufactures custom farm machinery and specialty products such as four-wheel-drive tractors. The facility consists of several assembly buildings and outdoor parts and equipment storage yards. According to Cheri Helzer of SWECO Products, the facility operates from 8 a.m. to 5 p.m.

Noise from the facility is highly variable depending on what manufacturing activities are occurring. Equipment movement and movement of parts by use of forklifts are the most significant sources of noise. As with the facilities described above, noise from the facility is generally confined to the SWECO property and is so small or intermittent that meaningful quantification of off-site noise is not possible. The facility is surrounded on three sides by residences and on one side by a school. According to Ms. Helzer, they have not received any complaints concerning noise.

Noise-Sensitive Areas

Places where people live, sleep, recreate, worship, and study are generally considered to be sensitive to noise because intrusive noise can be disruptive to these activities. Specific areas considered sensitive to noise include:

- residences,
- hospitals or healthcare facilities,
- parks and wildlife areas,
- places of worship,
- libraries, and
- schools.

These areas in the County are identified and discussed in the following section.

SUTTER COUNTY

NOISE GENERATING LOCATIONS



0 10000 20000
SCALE IN FEET

prepared by the
SUTTER COUNTY COMMUNITY SERVICES DEPARTMENT

LEGEND

- ✕ Permitted surface mining location
- ▲ Existing commercial/Industrial location
- Grain processing/storage location
- ▨ Proposed industrial area

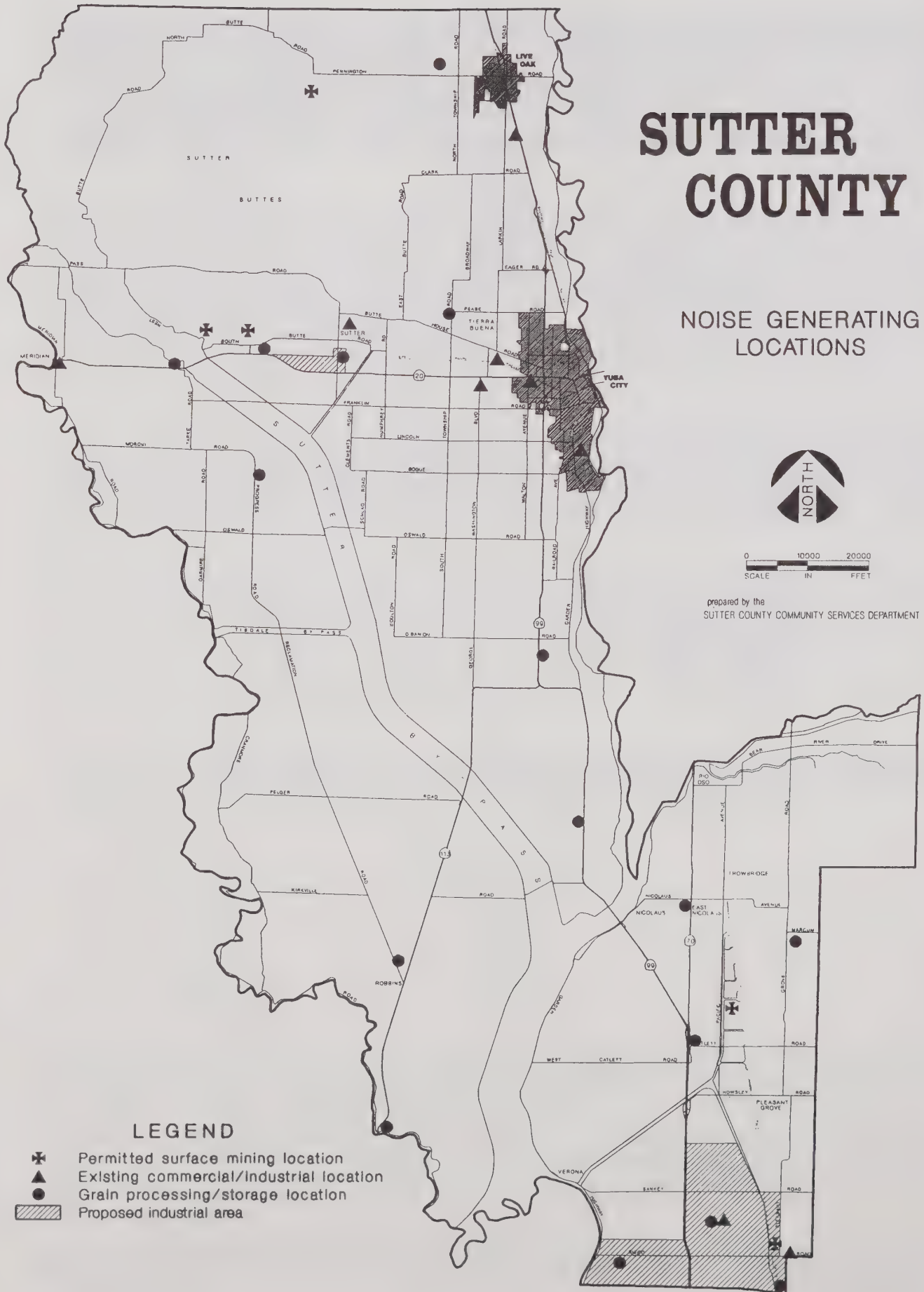


Figure 12.1-6
Noise Generating Locations

Residences

Sutter County is a rural county with most of the population concentrated in the urban areas around Yuba City and Live Oak. Outside these urban areas there are small population concentrations in agricultural communities scattered throughout the County. Outside these communities there are scattered individual dwellings.

Hospitals and Healthcare Facilities

No hospitals or healthcare facilities are located in the unincorporated County.

Parks, Wildlife Areas, and Recreation Areas

Public parks, wildlife areas, and other recreation areas, including campgrounds and picnic areas in the unincorporated County, are identified in Figures 12.1-7 and 12.1-8 and include:

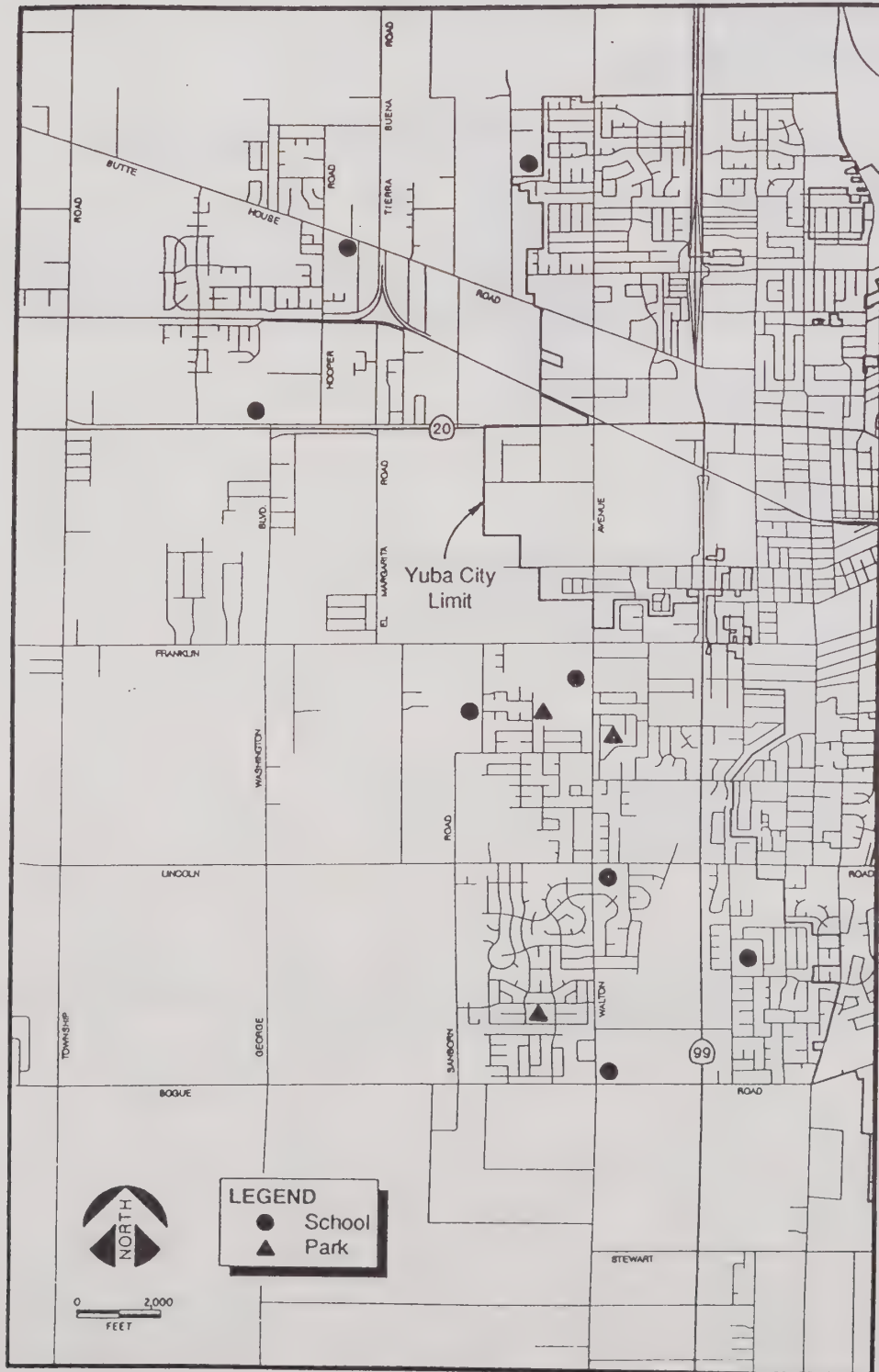
- West Walton Park,
- Happy Park,
- Holly Tree Park,
- Shanghai Park,
- Donahue Park,
- Gray Lodge Waterfowl Management Area,
- Sutter National Wildlife Refuge,
- Lovey's Landing (marina),
- Joe's Place (marina),
- Verona Marina,
- Lake Minden,
- Rio Ramaza Marina,
- Live Oak Recreation Area, and
- Bobolink Sanctuary.

Places of Worship

Due to the large number of churches, synagogues, and other types of worship in the unincorporated County, they are not specifically identified within the General Plan.

FIGURE 12.1-7

NOISE SENSITIVE AREAS IN THE YUBA CITY URBAN AREA



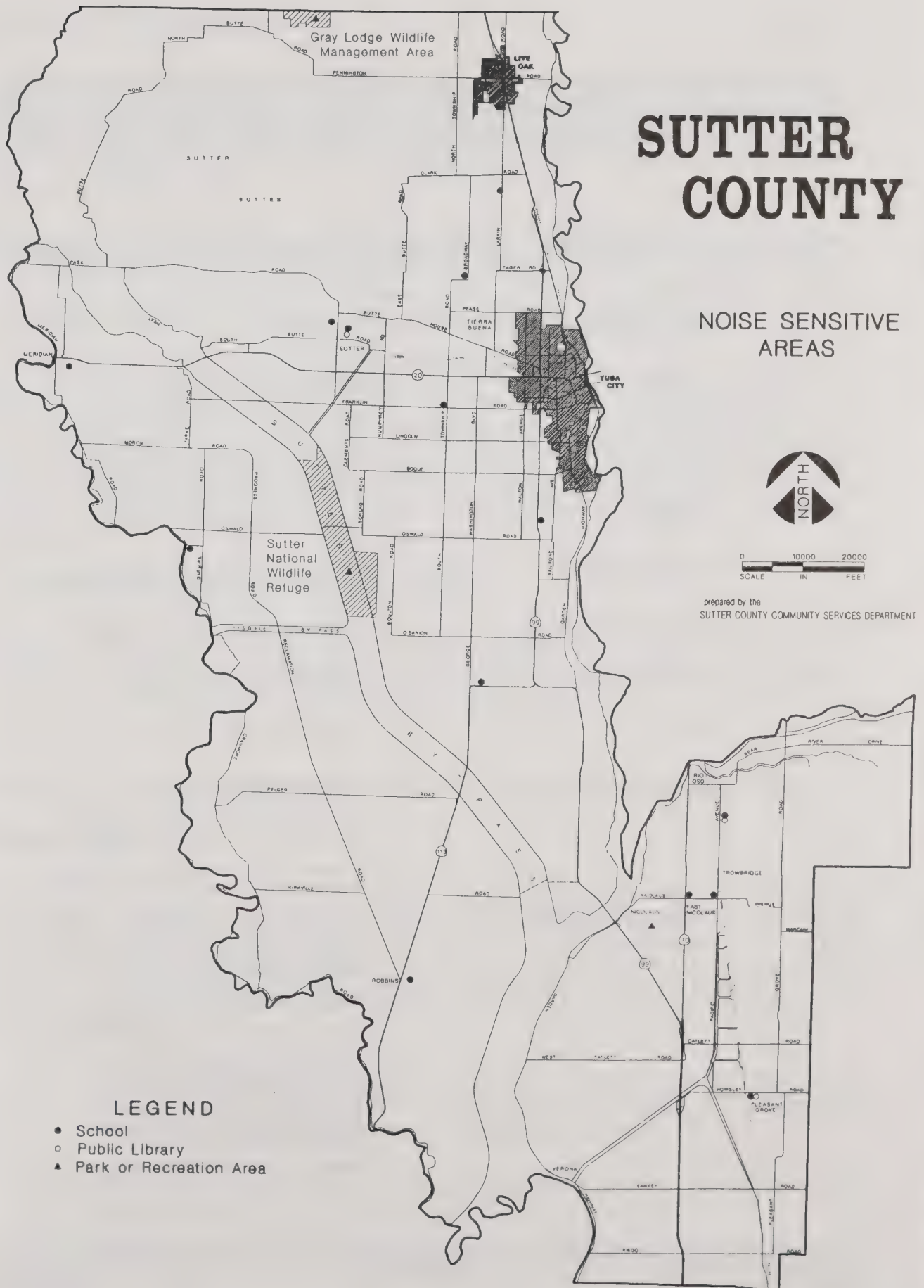


Figure 12.1-8
Noise Sensitive Areas Outside of the
Yuba City and Live Oak Spheres of Influence

Libraries

The three libraries in the unincorporated County are the Sutter Branch Library located in Sutter, the Rio Oso Branch at Brown's Elementary School in Rio Oso, and the Pleasant Grove Branch at the Pleasant Grove Elementary School in Pleasant Grove. These libraries are identified in Figure 12.1-8.

Schools

Schools in the unincorporated County are identified in Figures 12.1-7 and 12.1-8 and are listed below.

<u>Community Area</u>	<u>School</u>
Sutter	Sutter High School Brittan Elementary School
Meridian	Meridian Elementary School
Robbins	Robbins Elementary School
Pleasant Grove	Pleasant Grove Elementary School
East Nicolaus	Marcum-Illinois Elem. School
East Nicolaus	East Nicolaus High School
Rio Oso	Brown Elementary School
Yuba City fringe area	A. Karperos School Faith Christian School (private) Seventh Day Adventist School (private) Grace Christian Academy (private)
Remaining County	Central Gather Elementary School Encinal Elementary School Nuestro Elementary School Winship Elementary School Tierra Buena Elementary School Franklin Elementary School Lincrest Elementary School Lincoln Elementary School Barry Elementary School Buena Vista Elementary School

COMMUNITY NOISE SURVEY

A community noise survey focusing on residential and park areas was conducted to quantify and document existing noise exposures at selected noise sensitive locations throughout the County. Monitoring sites were selected to represent typical conditions in the County. Monitoring locations are depicted in Figures 12.1-9 and 12.1-10. Monitoring was conducted using Larsen-Davis Model 700/Type 2 sound-level meters.

Twenty-four hour monitoring was conducted at a residential location southeast of Yuba City along George Washington Boulevard between Franklin Road and Lincoln Road. Hourly average L_{eq} values, the 24-hour L_{dn} , the 24-hour CNEL value, and the maximum and minimum hourly L_{eq} values are summarized in Table 12.1-5. Figure 12.1-11 depicts measured hourly L_{eq} values.

Short-term monitoring (15 minutes in duration) was conducted at 11 locations throughout the County. Monitoring positions are described in Table 12.1-6 and are identified in Figures 12.1-9 and 12.1-10. L_{eq} , L_{min} , L_{max} , L_{10} , L_{33} , L_{50} , and L_{90} values measured over the duration of the monitoring period were logged and are reported in Table 12.1-6. L_{dn} values for each short-term location were developed using the short-term monitoring data and the relationship between measured hourly noise levels at the 24-hour site and the L_{dn} value calculated at the 24-hour site. Estimated L_{dn} values are given in Table 12.1-6.

EXISTING NOISE CONFLICTS IN SUTTER COUNTY

In general, existing noise conflicts are very few in unincorporated Sutter County. A key indicator of noise conflicts is the number of complaints registered with the County. Because noise complaints to County staff are rare, the County does not have a formal process for recording and acting on complaints.

The following discussion summarizes conflicts related to specific noise sources in the County.

Roadway Traffic

Outside the Yuba City urban area little noise sensitive development exists in the County adjacent to roadways with significant traffic volume (i.e., greater than 2,000 vehicles per day.) Riego Road between Placer County line and SR 99 is the only county road outside the general Yuba City area that has traffic volume greater than 2,000 vehicles per day. In the Yuba City fringe area, several residential areas are exposed to noise traffic levels in excess of 60 L_{dn} . As shown in Figure 12.1-2, these areas include:

- Residences adjacent to SR 99, Walton Avenue, Franklin Road, Richland Road, Lincoln Avenue, and Bogue Road in the area roughly bounded by the Yuba City limits, Bogue Road, Sanborn Road, and Franklin Road;
- Residences east of George Washington Boulevard between Lincoln Road and Franklin Road;

- Residences adjacent to Franklin Road between Lindsey Lane and El Margarita Road;
- Residences adjacent to George Washington Boulevard on Lynwood Drive and Hillview Drive;
- Residences southeast of the SR 20/Township Road intersection;
- Residences adjacent to SR 20 between El Margarita Road and Harter Road; and
- Residences adjacent to Butte House Road between Delle Drive and Hooper Road.

Aircraft

In accordance with commonly used standards in the region, 65 CNEL is considered to be an acceptable aircraft noise level for residential land uses near a general aviation airport. Sacramento International Airport has adopted 60 CNEL as acceptable. By this standard, no noise-sensitive land uses exist in the unincorporated county that are exposed to excessive aircraft noise near Sutter County Airport.

Residents in the Rio Ramaza mobile home subdivision and some scattered residents in the south county area are exposed to aircraft noise levels from Sacramento International in excess of 60 CNEL. Using 60 CNEL as the acceptable aircraft noise level near Sacramento International, aircraft noise at these residences is considered excessive. The county has no complaints on record concerning noise from aircraft traffic at Sacramento International. However, residents in the vicinity of the airport have complained verbally to county staff about noise from aircraft operations over Sutter County.

Trains

Outside the incorporated urban areas there are a few scattered farm residences located within the 60- L_{dn} contour line.

Natural Gas Extraction Facilities

No complaints are recorded with the county concerning noise from natural gas compressors. Mike Philips of Anacapa Oil has had one experience with a landowner in which noise from a compressor was a problem. Construction of a barrier around the unit solved the problem. Otherwise, no conflicts exist between natural gas compressors and noise-sensitive land uses.

FIGURE 12.1-9

NOISE MONITORING POSITIONS IN THE
YUBA CITY URBAN AREA

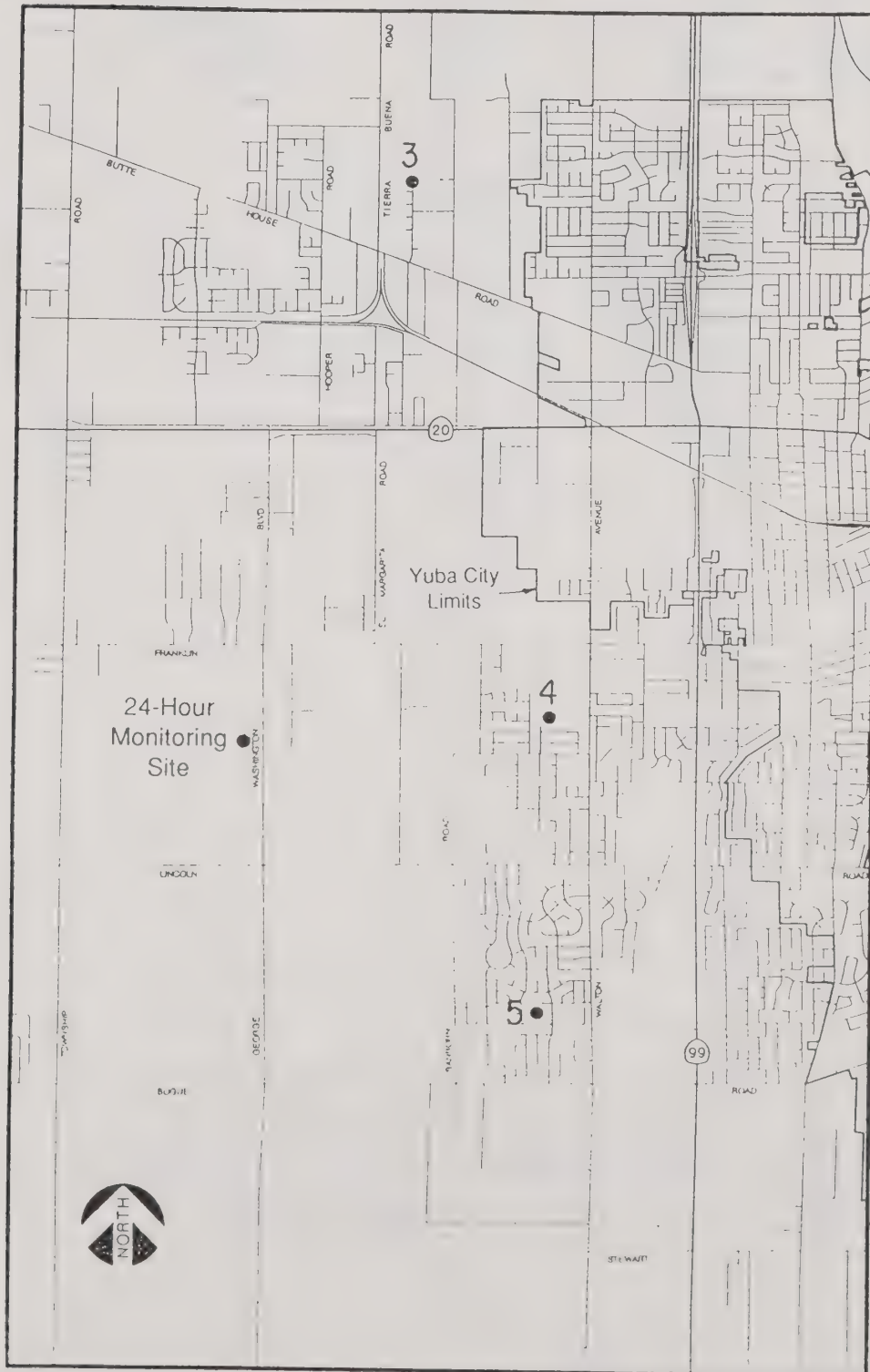
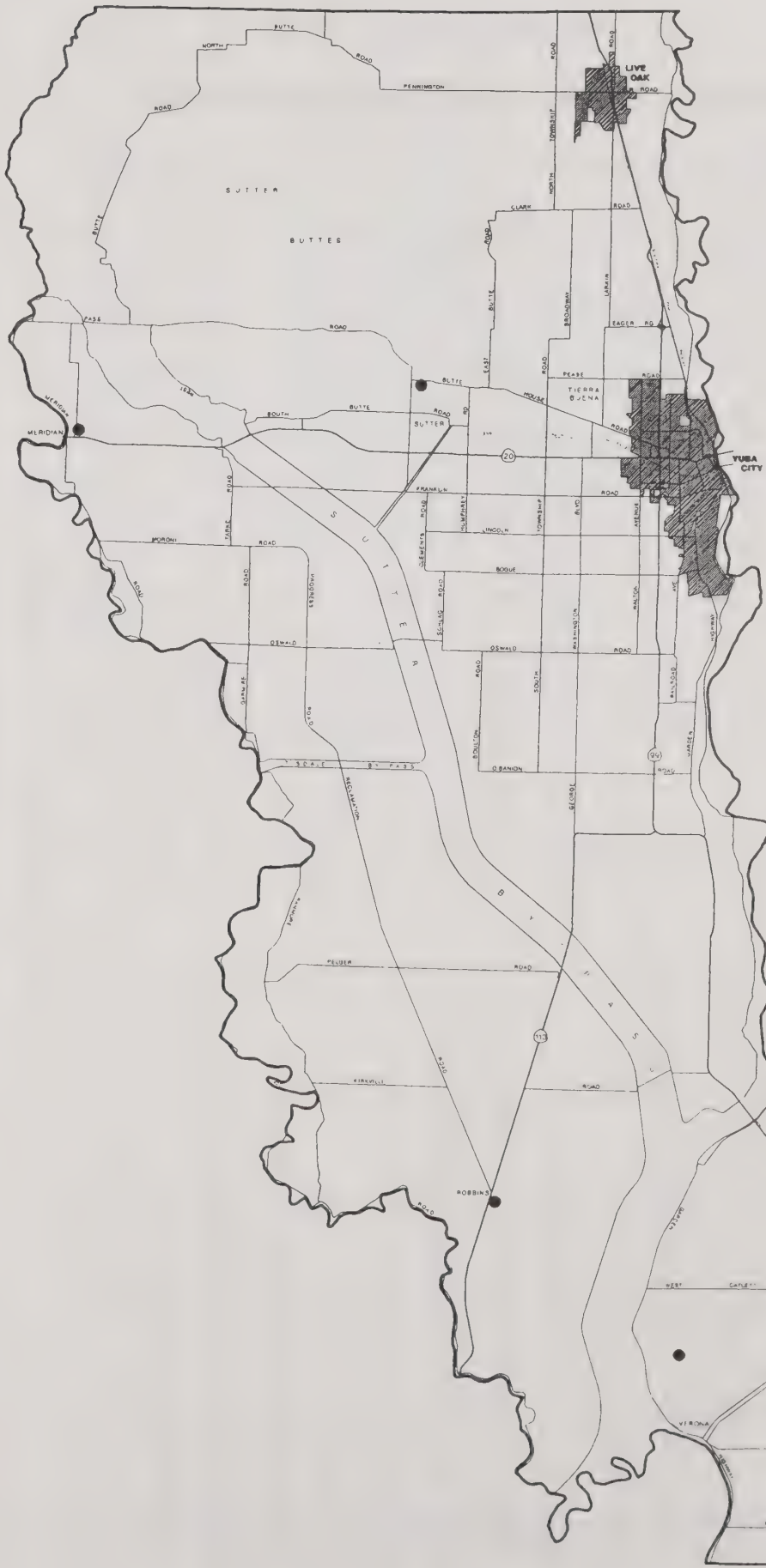


TABLE 12.1-5
SUMMARY OF 24-HOUR NOISE MONITORING RESULTS

24-Hour Ldn	24-Hour CNEL	24-Hour Maximum Hourly Leq
63.8 dBA	64.2 dBA	63.4 dBA 7 a.m.

Time	1-Hour Leq
Midnight	52
1 a.m.	51
2 a.m.	53
3 a.m.	56
4 a.m.	51
5 a.m.	57
6 a.m.	62
7 a.m.	63
8 a.m.	63
9 a.m.	62
10 a.m.	62
11 a.m.	62
NOON	62
1 p.m.	62
2 p.m.	61
3 p.m.	62
4 p.m.	63
5 p.m.	63
6 p.m.	61
7 p.m.	60
8 p.m.	59
9 p.m.	58
10 p.m.	56
11 p.m.	53

Note: The test site was on George Washington Boulevard between Franklin Road and Lincoln Road, approximately 100 feet from the centerline of the road. The test period was from 10 a.m., on January 5, 1994 to 10 a.m., January 6, 1994.



SUTTER COUNTY

NOISE MONITORING POSITIONS



prepared by the
SUTTER COUNTY COMMUNITY SERVICES DEPARTMENT

Figure 12.1-10
Noise Monitoring Positions Outside
of the Yuba City Sphere of Influence

FIGURE 12.1-11

ONE-HOUR LEQ TIME HISTORY AT 24-HOUR SITE

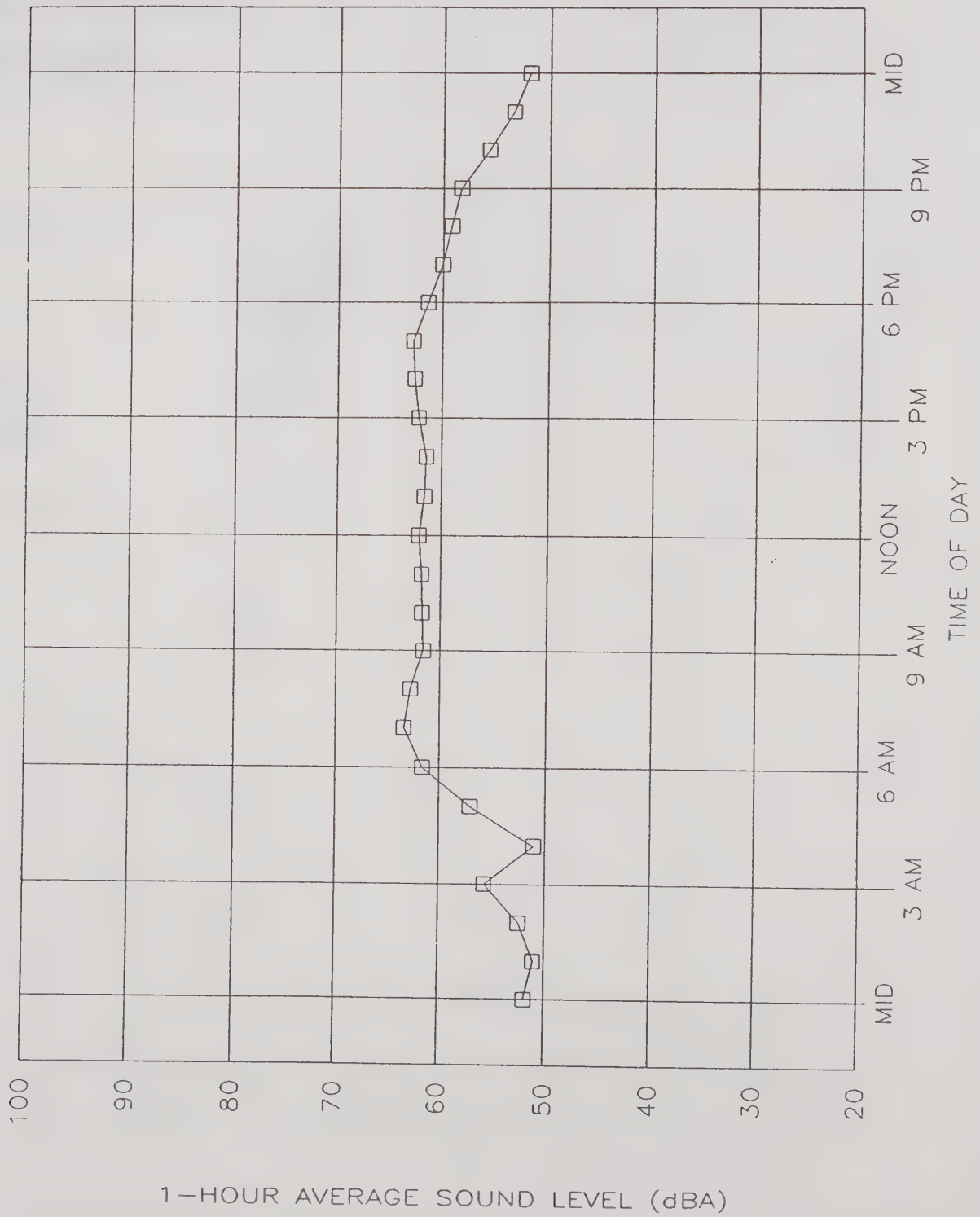


TABLE 12.1-6

SUMMARY OF COMMUNITY NOISE SURVEY

Location	Start Time	Stop Time	Duration (min)	Leg	Lmin	Lmax	L10	L33	L50	L90	Ldn
1. Mawson Road 0.25 mile north of SR 20	9:34 am	9:49 am	15	50	38	60	53	50	48	42	52
2. California Street between Sutter Road and Butte House Road	10:23 am	10:38 am	15	45	36	61	49	44	41	37	47
3. The end of Romero Street, just north of Zamora Street	11:00 am	11:15 am	15	52	41	68	54	51	49	45	54
4. West Walton Park	11:50 am	12:05 pm	15	52	41	66	56	47	45	42	54
5. Germaine Drive between Harbor Town Drive and Beach Drive	12:29 pm	12:44 pm	15	51	38	67	53	48	46	40	52
6. Reclamation Road between Maddock Road and Seymour Road	1:12 pm	1:27 pm	15	58	40	72	62	57	53	46	61
7. Kempton Road between SR 70 and Pacific Avenue	2:02pm	2:17pm	15	54	39	71	54	51	50	45	56
8. Marcum Road between SR 70 and Pacific Avenue	2:32 pm	2:47 pm	15	54	49	64	56	54	53	51	56
9. Garden Highway between SR 70 and Cornelius Road	2:52 pm	3:07 pm	15	53	39	67	55	51	48	41	55
10. Vernon Road between Garden Highway and West Catlett Road	4:13 pm	4:23 pm	10	45	35	60	48	43	40	37	46
11. Pleasant Grove Road between Howsley Road and Catlett Road	9:57 am	10:12 am	15	54	37	69	57	49	43	39	56

Note: Noise measurements were taken on January 5, 1994, except the measurement at Site Location 3, which was taken on January 6, 1994.

Ldn values are estimated based on short-term measured levels and hourly levels measured at the 24-hour site.

SUTTER COUNTY

60 LDN NOISE CONTOURS FOR 2015 GENERAL PLAN BUILD-OUT



prepared by the
SUTTER COUNTY COMMUNITY SERVICES DEPARTMENT

NOTE: DEPICTS THE 60 LDN CONTOUR FOR
2015 GENERAL PLAN BUILD-OUT WITH
PROPOSED ROADWAY IMPROVEMENTS

FIGURE 12.1-12
60 LDN NOISE CONTOURS FOR
2015 GENERAL PLAN BUILD-OUT

Construction Sites

No construction sites are identified where noise is a problem for existing sensitive land uses.

Mining Activities

Because mining sites in Sutter County are isolated from population areas, no noise conflicts exist between mining sites and existing sensitive land uses.

Farming Activities

Because farming activity typically occurs in open, unpopulated areas, no noise conflicts exist between farming activity and noise-sensitive land uses.

Other Miscellaneous Facilities and Plants

No major grain storage facilities are located adjacent to populated areas. The small commercial/industrial center west of Yuba City near the intersection of George Washington Boulevard and SR 20 is not directly adjacent to sensitive land uses, and noise from activities in the area is generally limited to the facility property. Therefore no conflicts exist between these facilities and noise-sensitive land uses.

The SWECO Products facility in the Sutter community area is located in the middle of a residential neighborhood. Because operation of the facility is limited to daytime hours and the generation of noise is primarily limited to activity associated with moving equipment and parts, a noise conflict has not developed. The lack of complaints to the facility operators regarding noise indicates that noise is not a problem for the community.

12.2 FINDINGS

- In general, existing noise conflicts are very few in unincorporated Sutter County.
- The predominant noise sources in Sutter County are mobile, including motor vehicles, aircraft, and trains. In particular, four major State Highways (i.e., Highways 20, 99, 70 & 113) and many other lesser roadways have major influences on the County noise environment.
- Portions of the County are exposed to noise from stationary sources, primarily industrial, agricultural, or commercial facilities. Natural gas extraction facilities, SWECO Products, the commercial/industrial area located at George Washington Boulevard and State Route 20 are representative of major types of stationary noise sources present in the County.
- Several noise measurements were conducted at various locations throughout the County near both roadways and stationary sources.

- Not all land uses are equally affected by noise. Land uses that are identified as noise sensitive include: residences of all types, schools, libraries, churches, hospitals, and health care facilities.
- Sensitive receptors which may currently be experiencing noise problems would include:
 - Residences adjacent to State Route 99, Walton Avenue, Franklin Road, Richland Road, Lincoln Road, and Bogue Road in the area roughly bounded by the Yuba City limits, Bogue Road, Sanborn Road and Franklin Road.
 - Residences east of George Washington Boulevard between Lincoln Road and Franklin Road.
 - Residences adjacent to Franklin Road between Lindsey Lane and El Margarita Road.
 - Residences adjacent to George Washington Boulevard on Lynwood Drive and Hillview Drive.
 - Residences southeast of State Route 20/Township Road intersection.
 - Residences adjacent to State Route 20 between El Margarita Road and Harter Road.
 - Residences adjacent to Butte House Road between Delle Drive and Hooper Road.
- No noise sensitive land uses exist in the unincorporated County that are exposed to excessive aircraft noise near the Sutter County Airport. The Rio Ramaza mobile home subdivision and some scattered residences in the South County area are exposed to aircraft noise levels from Sacramento International Airport in excess of 60 CNEL.
- Outside the incorporated urban areas there are a few scattered farm residences located within the 60 L_{dn} contour line.

12.3 GLOSSARY

Ambient Noise Level - The all encompassing noise associated with a given environment at a specified time that is usually a composite of sound from many sources at many directions. No particular sound is dominant.

A-Weighted - The sound level in decibels as measured on a sound level meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of sound in a manner similar to the response of the human ear and gives good correlation with subjective reactions to noise.

CNEL (Community Noise Equivalent Level) - A 24-hour energy equivalent level derived from a variety of single-noise events, with weighting factors of 5 and 10 dBA applied to the evening (7 p.m. to 10 p.m.) and nighttime (10 p.m. to 7 a.m.) periods, respectively, to allow for the greater sensitivity to noise during these hours.

dB (Decibel) - Logarithmic decibel scale which is a measure of loudness measured by pressure fluctuations caused by sound waves.

dBA (A-Weighted Decibel Scale) - dBA is a composite decibel scale that approximates the way the human ear responds to a broad range of sound frequencies using frequency-weighting schemes.

FHWA Traffic Noise Prediction Model - A model used to calculate noise levels produced by traffic on State highways and roads with more than 2,000 vehicles per day. The model estimates traffic noise levels based on roadway geometrics; traffic volumes for automobiles, medium trucks, heavy trucks; vehicle speeds; and a noise attenuation parameter.

Frequency - The number of times per second that a sound pressure signal oscillates about the prevailing atmosphere pressure.

L_{dn} (Day-Night Average Level) - The average A-weighted sound level during a 24 hour day, obtained after addition of 10 decibels to sound levels in the night after 10 p.m. and before 7 a.m.

L_{eq} (Equivalent Energy Level) - The sound level corresponding to a steady state sound level containing the same total energy as a time varying signal over a given sample period. L_{eq} is typically computed over 1, 8 and 24 hour sample periods.

Noise - Any unwanted sound or sound which is undesirable because it interferes with speech and hearing, or is intense enough to damage hearing, or is otherwise annoying.

Noise Attenuation - The ability of a material, substance, or medium to reduce the dB level from one place to another or between one room and another. Noise attenuation is specified in decibels.

Noise Control Act of 1972 - The Federal law which requires all Federal agencies to administer their programs to promote an environment free of noise that jeopardizes public health or welfare.

Noise Exposure Contours - Lines drawn around a noise source indicating constant or equal level of noise exposure. CNEL and L_{dn} are typical metrics used.

Noise Sensitive Land Use - Those specific land uses which have associated indoor and/or outdoor human activities that may be subject to stress and/or significant interference from noise produced by community sound sources. Such human activity typically occurs daily for continuous periods of 24 hours or is of such a nature that noise is significantly disruptive to activities that occur for short periods.

Percentile Level - A noise metric used to describe a given noise environment. This is the sound level that is exceeded during a given percentage of a stated measurement period.

Sound Level Meter - An instrument including a microphone, an amplifier, an output meter, and frequency weighing networks for the measurement and determination of noise and sound levels.

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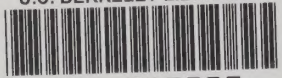
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